International Journal of Pharmaceutical and Bio-Medical Science

ISSN(print): 2767-827X, ISSN(online): 2767-830X

Volume 06 Issue 05 May 2026

Page No : 1047-1065

DOI: https://doi.org/10.47191/ijpbms/v6-i5-10, Impact Factor: 8.428

Ethnopharmacological Study: The Potential of Endemic Papuan Plants as Antioxidants

Yohana Krisostoma Anduk Mbulang*[1], Felycitae Ekalaya Appa[2], Juniarto Mende[3], Graciano Aristedis Maturbongs[4], Andre Anusta Barus[5]

[1,2,3,4,5]Department of Pharmacy, Cenderawasih University, Papua, Indonesia

ABSTRACT

Background: Indonesia is rich in biodiversity, particularly in terms of its flora. Papua is a region in eastern Indonesia; its climate and environment make it home to an abundance of endemic plants. The potential of these endemic plants for medicinal use has not yet been extensively studied.

Aims: The purpose of this study is to map the distribution of Papua's endemic plants with antioxidant potential, as well as their traditional uses.

Methodology: The methods used were a *narrative review* and a *literature review*.

Results: The results indicate that there are 32 areas in Papua with endemic plants rich in antioxidants, comprising 70 endemic plant species.

Conclusion: Papua is rich in antioxidants that have been utilised empirically by communities across various regions of Papua and by Papuan tribes

KEYWORDS: Antioxidants, Ethnopharmacology, Papua, Endemic plants

ARTICLE DETAILS

Published On:
28 May 2026

Available on:
https://ijpbms.com/

INTRODUCTION

Antioxidants are compounds that donate one of their electrons to free radicals, thereby stabilising the free radicals(1). Antioxidants are molecules capable of inhibiting oxidation reactions; they are molecules that can donate one or more electrons to free radicals, thereby neutralising them. Based on their source, there are two types of antioxidants: natural antioxidants and synthetic antioxidants (2). According to the classification by Sen and Chakraborty (2011), antioxidants are divided into two categories: enzymatic and non-enzymatic antioxidants. Enzymatic antioxidants constitute the primary defence system against oxidative stress(3). These enzymes are metalloproteins whose activity is highly dependent on the presence of metal ions and which function by preventing the formation of new free radical compounds.

Antioxidants are classified into six categories based on their source: Endogenous Antioxidants, such as bilirubin, glutathione, lipoic acid, NADH, NADPH, and enzymes (SOD, GR, GPx). Dietary Antioxidants, such as vitamin E, vitamin C, beta-carotene, xanthophylls, and polyphenols. Metal-Binding Proteins, e.g. albumin, metallothionein, ferritin, transferrin. The classification of antioxidants based on their mechanism of action consists of three categories: Catalysts for neutralising ROS, e.g. SOD; CAT; GPx; Metal ion binding to prevent ROS production via the Haber-Weiss reaction, e.g. ferritin, ceruloplasmin, catechins. Antioxidant chain breaking, which destroys ROS, e.g. Vitamin C, Vitamin E, Glutathione, flavonoids. Plants generally possess antioxidant potential.

Specimen documentation is the primary evidence regarding knowledge of flora. It is therefore not surprising that publications on Papuan botany are very limited, let alone summary-type information. The literature, consisting mostly of technical articles, is scattered across various journals and books (written in various languages), or has limited circulation. There is no general guide such as the information available for Papua Nugini (e.g., Borrell 1989, Conn 1995, Henty 1981, Johns 1987, 1988, 1989, Peekel 1984, Percival and Womersley 1975, Womersley 1978), although to a certain extent there are many similarities between the flora of Papua and that of PNG.

General reports are also very limited in number, consisting mainly of summaries of various expeditions (Archbold et al.

1942, Brass 1941, Donnelly et al. 2004, Mack and Alonso 2000, Rand and Brass 1940, Ridley 1916, van Royen 1960, Takeuchi 2003b, Vink 1965, Wollaston 1914), botanical reviews (Conn 1994, Frodin 1988, 1990, Frodin and Gressitt 1982, Stevens 1989), plant lists (Coode et al. 1997, Sidiyasa et al. 1997, Streimann 1986), conservation studies (Craven and de Fretes 1987, Erftemeijer et al. 1989, Ruitenbeek 1992, Supriatna et al. 1999) and vegetation descriptions (van Balgooy 2001, Gibbs 1917, Hope 1976, Kalkman 1963, Mangen 1993, Rappard and van Royen 1959, van Royen 1956, 1963, 1965, 1967). Therefore, increased vegetation inventory and survey work in Papua will yield remarkable new findings, particularly regarding endemism, environmental quality and the biogeography of the flora.

Papua possesses several endemic species, although the collection is very limited. New Guinea has long been recognised as a centre of biodiversity, and the ongoing revision of Flora Malesiana (FM) supports this fact. Information to supplement the revision of the FM indicates that there are more endemic species in New Guinea than in any other region of Malesia; several taxa are concentrated in the northern part of the island (van Balgooy et al. 1996). Supriatna et al. (1999) estimated that endemism at the species level in Papua reaches 60–90%, and Johns (1995) estimated around 60–70% for the whole of New Guinea. Endemic plants with antioxidant potential have not been extensively studied, as reports on their distribution and empirical use have not been fully documented; hence, the research titled "Ethnopharmacological Study: The Potential of Papua's Endemic Plants as Antioxidants" was conducted. This study aims to map the distribution of Papua's endemic plants with antioxidant potential, as well as their empirical use.

METHODS

This study was conducted by reviewing several scientific articles that have been researched or published. The data obtained from this study utilised a narrative review method, drawing from databases such as Google Scholar, PubMed, and ScienceDirect. The findings of this study were intended to identify several endemic plants of Papua with antioxidant potential that are still used by specific ethnic groups or communities. The review of the empirical use of endemic plants of Papua employed a literature review method by filtering accurate information from various sources in line with the research objectives. The distribution of endemic plants was mapped using GPS and visualised on a map.

RESULT DAN CONCLUSION

A. Distribution of Papuan Endemic Plants with Antioxidant Potential

The Papuan people consist of 254 ethnic groups inhabiting four ecological zones, namely: (1) the swamp, coastal and riverine zones; (2) the highland zone; (3) the foothill and small valley zones; and (4) the lowland, coastal and island zones. The Papuan people are scattered across these four zones, so when developing policies for them, they cannot be treated uniformly as their cultural characteristics differ according to the zone in which they live(4).

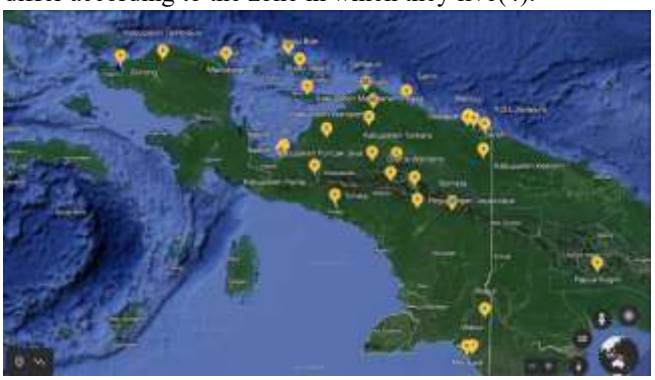

Figure 1. Map of the Distribution of Medicinal Plants in Papua as Antioxidants

The research findings indicate that there are approximately 20 plant families used for medicinal purposes, namely *Plantaginaceae, Asteraceae, Crassulaceae, Zingiberaceae, Solanaceae, Lamiaceae, Apiaceae, Boraginaceae, Achantaceae, Cannaceae, Oxalidaceae, Campanulaceae, Selaginellaceae, Equisetaceae, Urticaceae, Rubiaceae, Nepenthaceae, Dipteridaceae,* and *Amaryllidaceae*. The parts of the plants utilised for medicinal purposes are the leaves, stems, flowers, rhizomes, and tubers(5).

The limited knowledge regarding plants in Papua indicates that many plant species remain undiscovered. Gaps in field exploration have been identified by Campbell (1989), Prance (1977), Stevens (1989) and Supriatna et al. (1999), so direct field studies in any location will yield new information. For example, a two-week survey along the coast near Kokas (Bomberai Peninsula) identified eight new plant taxa (Takeuchi 2003a) (Figure 3.1.1). Vegetation distribution maps (Middleton 1997, Pannell 1992) indicate uneven sampling. Given the limited botanical exploration in Papua, even surveys using brief study methods will yield highly valuable findings. The disparity in scientific information between Papua and PNG is reflected in local infrastructure conditions.

B. Empirical Use of Endemic Papuan Plants with Antioxidant Potential (Literature Review)

Papua is a fertile region, primarily due to its volcanic factors, high rainfall throughout the year, and dense tropical rainforest areas. This combination creates soil rich in biomass with an excellent natural nutrient cycle. It is highly likely that these plants are a source of antioxidants that has not yet been fully utilised. Several species of endemic Papuan plants are already known to possess antioxidant properties, as summarised in Table 1. Therefore, the conservation of these endemic species and further exploration of the antioxidant potential of other endemic Papuan plant species are of great importance.

Table 1. List of endemic Papuan plants with antioxidant potential

No	Plant Name			Empirical Benefits	Antioxidant Test IC_{50}	Potential Compounds	References
	Indonesia	Local (Papua)	Scientific				
1.	Lobi-Lobi (Jayapura)	Tomi-Tomi	*Flacourtia inermis, Roxb*	Reduces blood sugar levels, antihypertensive, and antioxidant.	67.6 µg/mL	Anthocyanins	(Fitriyani, 2018)(6)
2.	Betel leaf (all ethnic groups)	Forest betel	*Piper andacum L.*	Wound healing, stopping vomiting, reducing nausea, aiding digestion, as an antiseptic, killing bacteria, fungi and viruses.	47,252 µg/mL	Flavonoids, gallic tannins, steroids/triterpenoids, and phenols	(Hutan *et al.*, 2023)(7)
3.	Pekak (Papua New Guinea)	Star anise	*Illicium verum*	Antimicrobial, anticancer and antioxidant.	54,759 µg/mL	Essential oil, flavonoids, saponins, tannins, glycosides, and terpenes	(Putri *et al.*, 2021)(8)
4.	Kebar grass (Tambrauw Regency)	Banondit	*Biophytum umbraculum Welw*	Used as a fertility remedy for women, to regulate menstruation, and to help increase sperm production.	27.74 µg/mL	Tannins, phenolic compounds, steroids, saponins, isoflavones, flavonoids, triterpenoids, alkaloids, steroids, glycosides.	(Widodo *et al.*, 2020) (9)
5.	Meniran (Sarmi)	Babiji Belakang	*Phyllanthus niruri L.*	For the treatment of kidney disorders and malaria.	17.64 µg/mL	Flavonoids, saponins, tannins (catechu and gallic), quinones, triterpenoids, coumarins and essential oils	(Marisi *et al.*, 2019) (10)
6.	Masoyi (Manokwari ,Sorong , Nabire, Biak Numfor, Yapen, Waropen, Merauke, Jayapura)	Aikori	*Massoia aromatica Becc.*	As an antimicrobial, phagocytic, cytotoxic, anti-inflammatory, immunomodulatory, antioxidant, analgesic agent, and for other effects via inhalation.	14.06 µg/mL	Flavonoids, phenols, alkaloids, steroids, triterpenoids, saponins, tannins, quinones, and coumarins.	Rosaria *et al.*, 2022)(11)
7.	Mulberry (Wamena)	Mulberry	*Morus rubra*	Used as a diuretic, fever remedy, a remedy for	12.6 µg/mL	Flavonoids, polyphenols and	(Pogaga *et al.*, 2020)(12)

				malaria and high blood pressure.		alkaloids	
8.	Agarwood (Biak)	-	*Aquilaria malaccensis Lamk*	Used as a remedy for , hepatitis, asthma, liver and kidney inflammation ( ), an antibiotic for TB, rheumatism, tumours, a nerve stimulant, stomach ache, aphrodisiac, lung ailments, cancer, malaria and stomach ulcers.	12,958 µg/mL	Flavonoids and phenolic compounds	(Surjanto *et al.*, 2019)(13)
9.	Lasun wood (Papua New Guinea)	-	*Dysoxylum alliaceum*	As an anticancer, antioxidant and antibacterial agent.	8.65 µg/mL	Alkaloids, biflavonoids, sesquiterpenes , diterpenes, triterpenes, and steroids	(Nurcahyanti *et al.*, 2015)(14)
10.	Mantangan Leaves (Papua New Guinea)	Fresh Leaves	*Merremia peltata (L.)* Merr	Used to treat boils, as a compress for wounds, and for skin conditions.	47.41 µg/mL	Alkaloids, flavonoids, saponins, terpenoids/steroids and phenolic compounds	(Muhti'atul, Hanafi and Elya, 2021)(15)
11.	Pulai	Milkwood (all ethnic groups)	(*Alstonia scholaris* L.)	An infusion made from the bark or dried wood is drunk to treat fever and malaria. It is also used to treat stomach ache or diarrhoea, coughs, and to induce abortion	48 µg/mL	Phenolic compounds and flavonoids	(Thahira *et al.*, 2021)(16)
12.	Ketul or ajeran	Ajeran leaves	(*Bidens pilosa* L.)	Heals swelling, rheumatism, boils, and external wounds	62.03 µg/mL	Flavonoids and terpenoids	(Sariningsih *et al.*, 2016)(17)
13.	Taro	Taro. Wamona, Kom, Nomo, Uma, Warimu, Hè kérè, Sè ké ré, Ifen, Yéfam	(*Colocasia esculenta* L. Schott)	Communities in the central highlands of Papua use the leaf stalks to treat pain, swelling and sprains	308 µg/mL	Phenolic compounds	(Nur-Hadirah *et al.,* 2021)(18)
14.	Ant nests	Ant nest	(*Myrmecodia* spp.)	Heals inflammation, relieves muscle pain, treats cancer and diabetes	566,087 µg/mL	Flavonoids, tannins, and polyphenolic compounds	(Moatar *et al.,* 2020)(19)
15.	Chinese	Chinese	(*Cassia*	Treats skin diseases,	9.96 µg/mL	Phenolic	(Bunya and

	ketepeng	ketepeng, Kaskado leaves (used almost throughout Papua)	*alata* Linn.)	particularly scabies or kaskado caused by the Sarcoptes scabiei mite or fungal skin infections caused by Tinea imbricate		compounds and flavonoids	Lihan, 2022)(20)
16.	Bone-healing plants	Bone-setting plant	(*Euphorbia tirucalli* L.)	Used as a liniment for sprains or fractures and to treat snake and fish bites	13.6 µg/ml	Phenolic compounds	(Abdel-Aty *et al*., 2019)(21)
17.	Rosella	Rosella	(*Hibiscus sabdariffa* L.)	Increases n, physical stamina and blood production	67.3 µg/mL	ic acid, phenols, anthocyanins and flavonoids	Inggrid *et al.,* 2018)(22)
18.	Black ginger	Forest ginger (Sentani)	(*Curcuma aeruginosa* Roxb.)	Increases appetite	15.42 ± 1.5 µg/ml	Phenolic compounds and flavonoids	(Zohmachhuana *et al.,* 2022)(23)
19.	Cat's whiskers plant	Cat's whiskers leaves	(*Orthosiphon* aristatus Blume Miq.)	A decoction made with wungu leaves can be used as a drink to treat kidney stones	65.62513 µg/mL	Flavonoids	(Salasa *et al.,* 2021)(24)
20.	Takokak	Wild aubergine, Mini aubergine	(*Solanum torvum* Sw.)	According to the people of Timika, it can be used as a natural substance to temporarily inhibit male fertility (sperm inactivation) for approximately 40 days after consumption (natural contraception)	85.58 µg/mL	Flavonoids, alkaloids, tannins, and saponins	(Helilusiatiningsih *et al.,* 2019)(25)
21.	Roda fruit	Kandarek (Biak tribe)	*Morinda citrifolia L.*	Antidiabetic, antihypertensive, antidiuretic,	62.3 mg/L.	Seronine alkaloid, plant steroid, alisarin, lysine, sodium, caprylic acid, arginine, proxeronine, anthraquinone, trace elements, phenylalanine, magnesium, terpenoids	(Ministry of Health, 2016)(26)
22.	Forest bitter gourd	Forest bitter gourd	*Momordica balsamina* Linn.	anti-inflammatory	127.95 µg/mL	alkaloids, steroids, phenolics and	(Awaladah *et al*., 2017)(27)

						flavonoids (Methanol extract)	
23.	African leaf	African leaf	*Vernonia amygdalina Del.*	cancer treatment, prevention of heart disease, lowering cholesterol, preventing stroke, regulating blood sugar, digestive disorders, and weight loss.	48.39 ppm	saponins, coumarins, phenolic acids, lignans, terpenes, luteolin and flavonoids	(Erwin *et al*., 2015; Handjojo, 2018)(28)
24.	Pandemor	Pandemor (biak numfor)	*Phempis acidula.*	Swelling, toothache, boils	-	Alkaloids, flavonoids, saponins, tannins, triterpenoids	(Tarakanita *et al*., 2019)(29)
25.	Abanik	Abanik (Lanny Jaya)	*Datura stramonium L. var.*	Runny nose, pain and fever	32.2 g/L	alkaloids, phytic acid, oxalate, tannin, terpenoids, flavonoids, saponins, phenols	(Sakadzo *et al*., 2018)(30)
26.	Aka lambuang	Sea spinach (Timika)	*Merremia peltata (L.)*	The fresh stem, softened or crushed, is used for fresh wounds, burns and old wounds. The softened stem is also used for pain and swelling. Slices of the stem are used to stop bleeding from fresh wounds. Fresh leaves can be used to heal skin wounds when applied directly to the wound. The pounded stem is dissolved in water and drunk to cure whooping cough. The sap of the young shoots is used to treat eye inflammation. Small slices of the stem are heated over a flame and the hot vapour is blown onto the affected area	LC_{50} of"Aka Lambuang" leaf extract: 19.678 ppm; the hexane fraction yielded an LC_{50} value of 22.029 ppm; the ethyl acetate fraction yielded an LC_{50} value of 130.918 ppm	terpenoids, steroids, saponins and phenolics	(Alen *et al*., 2016;(31) Honesty, 2012).(32)

27.	Forest katuk	Forest katuk	*Breynia cernua*	treats breast cancer breast cancer and cervical cancer.	IC_{50} values are 246,841 ppm, 165.65 ppm, 562.57 ppm and 713.78 ppm	, flavonoids and quinones	(Khan *et al*., 2008;(33) Dirgantara, 2018)(34)
28.	Jilat leaves	Jilat Leaf	*Villebrunear ubesces*	heals bruises	61.82 µm	alkaloids, tannins, saponins, quinones, and steroids with antibacterial activity, and cytotoxic properties (containing active compounds for anticancer use).	(Gunawan, 2018)(35)
29.	Sea grape (ambai)	Sea Grapes	*Caulerpa sp.*	Antifungal	1000 ppm	saponins and flavonoids	(Dimara *et al*., 2011; Siregar, 1991)(36)
30.	Nelambo Suon (Yali tribe)		*Rubiaceae*	Antimalarial	IC_{50} values of 535.89 ppm at 29 minutes and 385.06 ppm at 59 minutes; the antioxidant test results indicate very weak activity.	alkaloids, flavonoids, tannins, steroid saponins, terpenoids, quinones	(Christomo *et al*., 2015)(37) (Oktolia *et al*., 2017)(38)
31.	Nutmeg	Nutmeg	*Myristica fragrans Houtt*	Nutmeg is used in medicine as a carminative, astringent, narcotic, aphrodisiac, and to treat flatulence, nausea and vomiting.	1.016082 µg/mL	Nutmeg possesses antioxidant activity	(Phulsagar *et al*., 2014;(39) Krishnamoorthy *et al*., 2003;(40) Liu et al., 2000)(41)
32.	Black Betel	Black Betel	*Piper betle var. nigra*	Empirical use of black betel leaves related to antioxidants involves the use of black betel leaves in the treatment of diabetes mellitus.	158.53 ppm	Alkaloids, flavonoids, saponins, tannins, steroids, triterpenoids and polyphenols	(Rija'i, 2015;(42) Backer and Bakhuizen van den Brink Jr, 1963)(43)
33.	Aru Root	Aru Root	*Caesalpinia bonduc*	a plant used as a remedy for malaria by the	783.05; 374.93; 696.84 mg/L	alkaloids, flavonoids, saponins,	(Singh & Raghav,2012 (44);

				Kanum tribe. Use of Caesalpinia bonduc, particularly the seeds, as a remedy is also practised by communities in Africa and India		tannins and triterpenoids	Assogbadjo *et al*., 2011)(45)
34.	Water Spinach Flower	Water Spinach Flower	*Ipomoea carnea Jack*	This plant has potential anti-inflammatory, antioxidant, antidiabetic, antimicrobial, wound-healing, immunomodulatory, cardiovascular, embryotoxic, antifungal, hepatoprotective, and inhibitory	12 ppm	flavonoids, saponins, polyphenols and alkaloids	(Sharma *et al*., 2013)(46)
35.	Elephant Grass Root	Imperata Cylindrica	*Imperata cylindrica (L) Beauv*.	Communities in Southeast Sulawesi have been using elephant grass roots (Imperata cylindrica) as a remedy for hypertension.	0.32 mg/mL	Phenols	(Mensah MEE *et al*., 2014)(47)
36.	Sidaguri	Sidaguri	*Sida rhombifolin Linn.*	The people of Timika use this plant to treat boils. The people of Dogiyai use this medicinal plant to treat diabetes mellitus (DM) by drinking a decoction of the leaves, stems and roots	4.26 µg/ml	Flavonoids, tannins and saponins	
37.	Gambir	Agya (Kanum people) and Ake (Marori and Marind people)	*Uncaria gambir (Hunt) Roxb.*	Used as a remedy for burns, headaches, diarrhoea, dysentery, as a mouthwash, for mouth ulcers and for skin ailments.	6.4 µg/mL	Flavonoids, catechins and tannins	

38.	African leaf	African leaves	*vernonia Amygdalina Del.*	This African plant is a herbal remedy first used in traditional Congolese medicine and is widely used in the treatment of malaria.	4.34 µg/mL	contains various secondary metabolites such as alkaloids, saponins, tannins, and glycosides	(Omoregie, 2011)(48)
39.	Matoa	Hatar (Trimuris, Mamberamo)	*Pometia pinnata* J.R. Foster & J.G Foster	A decoction of the leaves and bark can be used to treat and festering wounds. A hot water infusion of the leaves is used to treat dysentery.	4 µg/mL (ethanol extract of matoa bark) 9 µg/mL (ethyl acetate extract of matoa bark) 5 µg/mL (chloroform extract of matoa bark) 25 µg/mL (n-hexane extract of matoa bark)	Phenolic compounds (flavonoids)	(Hasan *et al*., 2022)(49)
40.	Zodia plant	*Evodia suaveolens* Sceff	*Evodia suaveolens*	used to repel mosquitoes	170 µg/mL (methanol extract of Zodia plant leaves)	secondary metabolites belonging to the alkaloid, flavonoid, and tannin groups	(Ngibad and Lilla, 2019)(50)
41.	Bintangur	Tembuy (Maribu) Bintangur (Papua)	*Callophylum inophylum L.*	Dried bintangur leaves are burned, and inhaling the smoke can alleviate vertigo and migraines	65.49 µg/mL (Ethanol extract fraction)	Flavonoid compounds	(Faisal *et al*, 2022)(51)
42.	Waru leaves	Wenata (Tamakuri, Waropen), Wakati (Merauke)	*Hibiscus tiliaceus*	As a remedy for bruises	58,564 ± 1,412 µg/mL (methanol extract of waru leaves)	Phenolic Compounds	(Putri *et al*., 2021)(52)
43.	Forest Katuk	Forest Katuk	*Phillanthus* sp. Var.	The leaves are used to treat breast cancer, uterine cancer and cysts	80.81 µg/mL (methanol extract of	Flavonoid compounds	(Zuhra *et al*., 2008)(53)

	Leaves		Papua		katuk leaves)		
44.	Castor	Yole (Lemongrass), Sot-Sot (Maribu) Becai (Sobey)	*Jatropha curcas* L.	Slightly young leaves to reduce fever. The tip of the stem for toothache	7.8 µg/mL (ethyl acetate extract of castor oil plant leaves) 7.2 µg/mL (ethyl acetate fraction of Jatropha curcas twigs)	flavonoid and polyphenol groups	(Setyaningsih *et al*., 2014)(54)
45.	Beluntas Sarmi	Beluntas	*Pluchea indica* (L.) Less	Used to prevent *postpartum* white blood cell infection	107 µg/mL (chloroform extract of beluntas leaves)	Phenolic compounds	(Nafisah and Tukiran, 2017)(55)
46.	Purple leaf	Blood leaf, red leaf	*Graptophyllum pictum* (L.) Griff	Used as a blood-building agent and for treating diarrhoea	125.09 µg/mL. (Purple leaf infusion)	Phenolic Compounds (Anthocyanins)	(Salim, 2018)(56)
47.	Areca Nut	Daud (Maribu), Afef-ou (Sereh), Auk (Waropen), Ropum (Nansfori)	*Areca catechu* L.	Used as a remedy for worms and toothache, and as a tooth strengthener	3.5 µg/ml (ethanol extract of areca nut)	Flavonoid Compounds	(Cahyanto, 2018)(57)
48.	Sambiloto	Sambiloto	*Adrographis paniculata* (Burm, f) Wall. ex Nees	Used to treat malaria	16,634 µg/mL (ethanol extract of sambiloto root)	Phenolic compounds (flavonoids)	(Utami 2021)(58)
49.	Forest pandan	Woromo	(*Pandanus jiulianettii martelli*)	The forest coconut pandan plant is used by the community for various daily purposes, ranging from food flavouring and medicine to religious ceremonies.	45.83 µg/mL	Methanol and Tocopherols	(Zebua and Purnamasari, 2017)(59)
50.	White wood	Huek	(*Eucalyptus alba*)	The huek fruit is used to treat liver disease and boost the immune system.	10,402 µg/mL	Methanol	(Darmakusuma *et al*., 2019)(60)
51.	Nutmeg	Hanggi	(*Myristica*	Nutmeg is used by	100.52	Alkaloids and	(Sari *et al*.,

			fragrans Houtt)	local people to treat diarrhoea and as an antibacterial agent.	µg/mL	flavonoids	2022)(61)
52.	Mahkota dewa	Mahkota dewa	(*Phaleria macrocarpa*)	Mahkota dewa is used as a medicinal plant for its antibacterial and antiviral properties, as well as to reduce blood sugar levels.	127.983 µg/mL	Flavonoids, saponins, polyphenols and alkaloids	(Kurang & Malaipada, 2021)(62)
53.	Pitcher plant	Pitcher plant	(*Nepenthes rafflesiana Jack*)	The pitcher plant is used in traditional medicine as eye drops, for burns, coughs, fever, hypertension, jaundice, incontinence, kidney stones, tenderness, as a wound cleanser, and to prevent or treat bedwetting in children.	38.83 µg/mL	Alkaloids, flavonoids, saponins, and tannins	(Putri *et al*., 2022)(63)
54.	Soursop	Soursop	(*Annona muricata*, Linn)	Soursop is used by local people to treat malaria using its leaves.	192.13 µg/mL	flavonoids, terpenoids, and tannins	(Alim *et al*., 2021)(64)
55.	Yellow root	Yellow root	(*Arcangelisia flava*)	Yellow root is used to treat various conditions such as ringworm, scabies, tinea, malaria, fever, and certain bacterial infections.	136.81 µg/mL	Alkaloids, flavonoids, saponins, and polyphenols,	(Suratno *et al*., 2019)(65)
56.	Noni	Noni	(*Morinda citrifolia* L)	Among local communities, noni is used as a remedy for stomach ache.	4.14 µg/mL (in leaf extract); 5.78 µg/mL (in fruit pulp extract); 0.68 µg/mL (in seed extract)	Polyphenols, alkaloids, saponins, flavonoids, and phenols.	(Qulub *et al*., 2018)(66)
57.	-sarai palm	Sarai	(*Caryota mitis*)	The sarai palm can be used as an ornamental plant, and its n starch can be extracted to produce sago, as well as serving as a traditional medicinal ingredient.	62.5 µg/mL	Flavonoids	(Abdelhaki *et al*., 2017)(67)
58.	Girang	Girang	(*Leea*	Girang roots are	1.62 µg/mL	Flavonoids,	(Kartikasari,

			indica)	useful as a remedy for fungal infections, malaria and stomach ache; the flowers can be used to treat boils; the leaves are useful for treating palpitations, dizziness, sprains and postnatal care; the wood is useful for treating wounds, and the bark can be used as an antidote to snake venom.		saponins, tannins, and polyphenols	2015)(68)
59.	Dollu (Lanny or central highlands)	Dollu	*Dodonaea viscosa (L.) Jacq*	Dollu leaves are heated over a flame or embers until they become oily ( ) and are then applied or pressed onto a fresh wound to to stop the bleeding and prevent infection, as well as accelerate wound healing	The highest scavenging activity in the flower and leaf parts was exhibited by WA extracts with an IC_{50} of 116.7 mg/mL and 47.99 mg/mL respectively	Polyphenols, oxygenated nor-diterpenes and diterpenes, alizarin, pinocembrin, penduletin, viscosol, isokaempferol and kaempferol-trimethyl ether	(Malik *et al*., 2022)(69)
60.	Pegagang, horse's foot (Kampung Bomela, Wamena)	Omeya	*Centella asiatica (L.) Urban*	For reducing fever or heat , epilepsy.	98.6 ± 1.6 µg/mL	Kaempferol, quercetin, and rutin. Chemical Brahmoside, centelosa, madecassosid e, brahmi acid, carotenoids, several minerals and possesses antimicrobial activity, acts as a diuretic, and is used for typhoid and influenza.	(Buranasudja *et al.,* 2021) (70)
61.	Sedge (Found almost throughout the Papua region)	omgas	*Imperata cylindrica (L.) Beauv*	Heals wounds, fever, headache, - bacterial, anti-inflammatory	192.07 ± 0.78 µg/mL)	lignin, holocellulose, alpha-cellulose, pentosan/hemi cellulose,	(Z.R. Razafindrak oto *et al.,* 2021)(71)

						arundoin, fernenol, isoarborinol, cylindrin, cylindol A, simiarenol, campesterol, stigmasterol, ß-sitosterol, scopoletin, scopolin, p-hydroxybenzaldehyde, catechol, chlorogenic acid, isochlorogenic acid, p-coumaric acid, neochlorogenic acid, acetic acid, oxalic acid, d-malic acid, citric acid, potassium (0.75% of dry weight), significant amounts of calcium, 5-hydroxytryptamine and flavonoids	
62.	Gedi leaves (Jayapura, Merauke, Jayawijaya)	swotpun	*Abelmoschus manihot (L.)*	treats kidney pain, lowers cholesterol, diarrhoea and stomach ulcers, toothache	233 bpj	phenolic compounds, flavonoids, steroids, alkaloids s and tannins,	(Manalu *et al.,* 2022) (72)
63.	Kemunting (Dani tribe)		*Rhodomyrtus tomentosa*	Treats diarrhoea, dysentery, inflammation, fever	Ethanol extract of young leaves 14.67 ppm, methanol extract of mature leaves 19.86 ppm	Tannins, flavonoids, phenols, amino acids, quinones, steroids.	(Kuntorini *et al.,* 2019) (73)
64.	Guava leaves (Throughout Papua)	giawas	*Psidium guajava L.*	Inflammation, diarrhoea, cholera	3.55 mg/L	flavonoids, alkaloids, tannins, saponins, anthocyanins,	(Sekarsari *et al.,* 2019) (74)

						carotenoids, essential oils, and phenols.	
65.	Porcupine flower (Dani tribe, Jayawijaya)	anikukuh	*Barleria prionitis*	Treats wounds	60.22 µg/mL	Alkaloids, flavonoids, phenols,	(Shukla, 2019) (75)
66.	Sugar cane (Jayawijaya, Merauke, Nabire, Sarmi)	yagar	*Saccharum officinarum L*	For physical stamina	72.65 ppm	Flavonoids, gallic acid	(Priyanto & Islamiyati, 2018) (76)
67.	Sambaing getih (Dani tribe, Jayawijaya)	Irugum	*Hemigraphis colorata Hall*	Internal heat, cough	24.15 ppm	Flavonoids, polyphenols, and tannins	(Dewi *et al.,* 2023) (77)
68.	Turmeric (Throughout Papua)	podi	*Curcuma longa L.*	digestive disorders, blood purifier, heart tonic, stomach tonic, diuretic	25.42 µg/mL	curcumin, demethoxycurcumin and bisdemethoxy curcumin	(Quirós-Fallas *et al.,* 2022) (78)
69.	Red Fruit (gan Tengah, Wamena)	tawi	*Pandanus conoideus* Lamk	fruit oil Red is used as cooking oil and a base ingredient for medicines. Pieces of of the red fruit, boiled together with sweet potato leaves, are used as pig feed. The leaves of the red fruit have not yet been utilised effectively, although it is known to be suitable for weaving.	37.69 µg/mL	carotenoids, tocopherols, beta-carotene , α-tocopherol, and fatty acids such as oleic acid, linoleic acid, linolenic acid, and decanoic acid.	(Susanti, Rohman and Setyaningsi, 2022 ; Wawo, Lestari and Setyowati, 2019) (79) ;(80)
70.	Papuan Grapes (Kayari (Yapen), Selre (Depapre, Sentani), Jayapura)	Arrayan	*Sararanga sinousa* Hemsley	As a mineral and vitamin supplement.	12.23 µg/mL	Syringic acid, isovanillic acid (hydroxybenzoic acid group), chlorogenic acid, 2-hydroxycinnamic acid, sinapic acid, caffeic acid, and ferulic acid (hydroxycinnamic acid group).	(Purnamasari ,Lunga and Widjanarko, 2020) (81)

CONCLUSION

Based on the results of the distribution of Papua's endemic plants with antioxidant potential, 32 regions across Papua were identified, namely Sorong and Manokwari (masoyi); Tambrau (kebar grass); Nabire (masoyi and sugarcane); Lani (red sugarcane); Nansfori (areca nut); Biak Numfor (masoyi and pandemor); Tamakuri (waru leaves); Trimuris (matoa); Mamberamo (matoa); Waropen (masoyi, waru leaves, areca nuts); Paniai (ant nests); Timika (Takokak, Aka lambuang, sidaguri); Sarmi (meniran, beluntas, sugarcane); Maribu (bintangur, castor oil plant, areca nuts); Depapre (Papuan grapes); Sereh (castor oil plant, areca nut); Tolikara, Puncak Jaya, Bupul and Wasur (ant nests); Wamena (Besaran, Pegagang, horse's foot); Lanny Jaya (Abanik, Dollu); Jayawijaya (Gedi leaves, porcupine flower, sugarcane, sambaing getih); Bomela (pegagang, horse's foot); Jayapura (lobi-lobi, masoyi, gedi leaves, Papua grapes); Keerom (milkwood, Chinese ketepeng); Merauke (masoyi, waru leaves, gedi leaves, sugarcane); PNG (pekak, lasun wood, mantangan leaves). Furthermore, based on a literature review of the empirical use of endemic Papuan plants with antioxidant potential, 70 plants were identified, with all parts of the plant—leaves, stems and roots—being utilised.

ACKNOWLEDGMENT

The authors sincerely acknowledge all parties for their support, guidance, and assistance in the completion of this research.

REFERENCES

I. Mukherjee B, Al Hoque A, Hota SH, Gope S, Ray M, Barman M, et al. Antioxidants and Their Physiological Role in Free Radical Scavenging. Diet Suppl Nutraceuticals [Internet]. 2025 Jan 1 [cited 2026 May 24];397–440. Available from: https://link.springer.com/rwe/10.1007/978-981-96-8622-3_12
II. Lobo V, Patil A, Phatak A, Chandra N. Free radicals, antioxidants and functional foods: Impact on human health. Pharmacogn Rev [Internet]. 2010 Jul [cited 2026 May 24];4(8):118–26. Available from: https://pubmed.ncbi.nlm.nih.gov/22228951/
III. Dalimunthe A, Pertiwi D, Muhmmad M, Kaban VE, Nasri N, Satria D. The effect of extraction methods towards antioxidant activity of ethanol extract of Picria fel-terrae Lour. Herbs. IOP Conf Ser Earth Environ Sci [Internet]. 2022 Dec 1 [cited 2026 May 24];1115(1):012040. Available from: https://iopscience.iop.org/article/10.1088/1755-1315/1115/1/012040
IV. Rumansara EH. Memahami Kebudayaan Lokal Papua : Suatu Pendekatan Pembangunan yang Manusiawi di Tanah Papua. J Ekol BIROKRASI [Internet]. 2015 Mar 2 [cited 2026 May 24];1(1). Available from: https://ejournal.uncen.ac.id/index.php/JEB/article/view/491
V. Maturahmah E, Sigit. Inventarisasi Tumbuhan Obat Dan Kearifan Lokal Masyarakat Suku Mandacan Dalam Memanfaatkan Tanaman Obat Di Desa Anggi Gida, Kabupaten. Pegunungan Arfak, Provinsi Papua Barat. Nusant J Ilmu Pengetah Sos. 2021;8(5).
VI. Fitriyani R, Lestario LN, Martono Y. Jenis dan Kandungan Antosianin Buah Tomi–Tomi. J Teknol dan Ind Pangan [Internet]. 2018 Dec 31;29(2):137–44. Available from: https://journal.ipb.ac.id/jtip/article/view/21081
VII. Mariani R, Perdana F, Widiana R. Aktivitas Antioksidan Ekstrak Daun, Bunga, dan Tangkai Sirih Hutan (Piper aduncum L.). JFIOnline | Print ISSN 1412-1107 | e-ISSN 2355-696X [Internet]. 2023 Jan 20;15(1):67–71. Available from: https://jfi-online.org/index.php/jfi/article/view/94
VIII. Putri EAM, Devi M, Soekopitojo S. KAPASITAS ANTIOKSIDAN TEH HERBAL DAUN NANGKA DAN REMPAH. Pros Pendidik Tek Boga Busana [Internet]. 2021 Oct 28;16(1). Available from: https://journal.uny.ac.id/index.php/ptbb/article/view/44652
IX. Widodo EY, I'tishom R, Purwanto B. Potensi Ekstrak Rumput Kebar (Biophytum petersianum Klotzsch) Dalam Mempertahankan Jumlah Sel Sertoli Mencit (Mus musculus) Model Diabetes Melitus. J Penelit Kesehat "SUARA FORIKES" (Journal Heal Res "Forikes Voice"). 2020 Apr 6;11(3):277.
X. Tambunan RM, Swandiny GF, Zaidan S. Uji Aktivitas Antioksidan dari Ekstrak Etanol 70% Herba Meniran (Phyllanthus niruri L.) Terstandar. Sainstech Farma J Ilmu Kefarmasian [Internet]. 2019 Nov 21;12(2):60–4. Available from: https://journal.istn.ac.id/index.php/saintechfarma/article/view/444
XI. Rosalia R, Setyaningsih D, Ahda A, Aziz S, Luthfiah SL, Apriani VD, et al. STUDI FITOKIMIA DAN AKTIVITAS FARMAKOLOGI DARI KULIT BATANG MESOYI (Massoia aromatica Becc.). J Buana Farma [Internet]. 2022 Jun 29;2(2):10–8. Available from: https://www.researchgate.net/publication/368262829_STUDI_FITOKIMIA_DAN_AKTIVITAS_FARMAKOLOGI_DARI_KULIT_BATANG_MESOYI_Massoia_aromatica_Becc
XII. Pogaga E, Yamlean PVY, Lebang JS. FORMULASI DAN UJI AKTIVITAS ANTIOKSIDAN KRIM EKSTRAK ETANOL

DAUN MURBEI (Morus alba L.) MENGGUNAKAN METODE DPPH (1,1-Diphenyl-2-Picrylhydrazyl). PHARMACON [Internet]. 2020 Aug 9;9(3):349–56. Available from: https://ejournal.unsrat.ac.id/v3/index.php/pharmacon/article/view/30018

XIII. Surjanto, Batubara R, Hanum TI, Pulungan W. Phytochemical and antioxidant activity of gaharu leaf tea (Aquilaria malaccensis Lamk) as raw material of tea from middle Tapanuli Regency, North Sumatera Province. IOP Conf Ser Earth Environ Sci [Internet]. 2019 May 1;260(1):012101. Available from: https://iopscience.iop.org/article/10.1088/1755-1315/260/1/012101

XIV. Nurcahyanti O, Julaeha E, Mayanti T. SENYAWA STEROID DARI KULIT BATANG Dysoxylum alliaceum DAN AKTIVITASNYA TERHADAP SEL KANKER PAYUDARA MCF-7. Chim Nat Acta [Internet]. 2015 Aug 12;3(2). Available from: https://jurnal.unpad.ac.id/jcena/article/view/9184

XV. Muthi'atul Af-Idah B, Hanafi M, Elya B. Antioxidant and Alpha Glucosidase Inhibitor Screening of Merremia peltata L. as Potential Traditional Treatment for Diabetes Mellitus. Pharmacogn J [Internet]. 2021 Jul 1;13(4):902–8. Available from: www.phcogj.com

XVI. Thahira DI, Perdana F, Noviyanti. Potensi Aktivitas Antioksidan Alstonia Scholaris dan Alstonia Macrophylla. Parapemikir J Ilm Farm. 2021;10(1):11–6.

XVII. Sariningsih R, Suzery M, Cahyono B. Uji Aktivitas Antioksidan dengan DPPH fraksi Etil Asetat Daun Bidens pilosa L. J Kim Sains dan Apl. 2016;19(3):83–6.

XVIII. Nur-Hadirah K, Arifullah M, Nazahatul AA, Klaiklay S, Chumkaew P, Norhazlini MZ, et al. Total phenolic content and antioxidant activity of an edible Aroid, Colocasia esculenta (L.) Schott. IOP Conf Ser Earth Environ Sci. 2021;756(1):6–13.

XIX. Moatar AE, Vlad CS, Vlad DC, Verdes DM, Filimon MN, Bloju O, et al. Evaluation of antiproliferative potential of myrmecodia pendans and its activity on il-8 secretion in colon cancer cell. Farmacia. 2020;68(4):710–4.

XX. Bunya SR, Lihan S. Effect of Extraction Techniques on Yield, Total Phenolic Content, Total Flavonoid Content and its Antioxidant Activity of Leaves, Stems and Roots from Cassia alata Linn. Asian J Med Biomed. 2022;6(S1):81–2.

XXI. Abdel-Aty AM, Hamed MB, Salama WH, Ali MM, Fahmy AS, Mohamed SA. Ficus carica, Ficus sycomorus and Euphorbia tirucalli latex extracts: Phytochemical screening, antioxidant and cytotoxic properties. Biocatal Agric Biotechnol. 2019;20:101199.

XXII. Inggrid M, Hartanto Y, Widjaja JF. Karakteristik Antioksidan pada Kelopak Bunga Rosella (Hibiscus sabdariffa Linn.). J Rekayasa Hijau. 2018;2(3):283–9.

XXIII. Zohmachhuana A, Malsawmdawngliana, Lalnunmawia F, Mathipi V, Lalrinzuali K, Kumar NS. Curcuma aeruginosa Roxb. exhibits cytotoxicity in A-549 and HeLa cells by inducing apoptosis through caspase-dependent pathways. Biomed Pharmacother. 2022;150(2022):113039.

XXIV. Salasa AM, Ratnah S, Abdullah T. Kandungan Total Flavonoid dan Aktivitas Antioksidan Ekstrak Daun Kumis Kucing (Orthosiphon stamineus B.). Media Farm. 2021;17(2):162–7.

XXV. Helilusiatiningsih N, Yunianta, Harijono, Widjanarko SB, Sujuti H. Aktivitas Sitotoksik Fraksi Heksana Terung Pokak (Solanum torvum) terhadap Sel Kanker T47D. J Kedokt Brawijaya. 2019;30(4):253–8.

XXVI. Peraturan Menteri Kesehatan Nomor 6 Tahun 2016 tentang Formularium Obat Herbal Asli Indonesia [Internet]. Available from: https://peraturan.bpk.go.id/Details/112998/permenkes-no-6-tahun-2016

XXVII. Awadallah AKE, Osman MEM, Ibrahim MA, Bernardes ES, Dias-Baruffi M, Konozy EHE. Isolation and partial characterization of 3 nontoxic d-galactose-specific isolectins from seeds of Momordica balsamina. J Mol Recognit [Internet]. 2017 Feb 1;30(2). Available from: https://pubmed.ncbi.nlm.nih.gov/27774692/

XXVIII. Erwin, Sulistyaningsih S, Kusuma IW. Isolation and MS study of friedelinol from the leaves of Terap (Artocarpus odoratissimus Blanco). Int J Pharma Bio Sci. 2015;6(1).

XXIX. Tarakanita DNS, Satriadi T, Jauhari A. POTENSI KEBERADAAN FITOKIMIA KAMALAKA (Phyllanthus emblica) BERDASARKAN PERBEDAAN KETINGGIAN TEMPAT TUMBUH. J Sylva Sci [Internet]. 2019 Apr 1;2(4):645–54. Available from: https://ppjp.ulm.ac.id/journals/index.php/jss/article/view/1845

XXX. Sakadzo N, Pahla I, Muzemu S, Mandumbu R, Makaza K. Herbicidal effects of Datura stramonium (L.) leaf extracts on Amaranthus hybridus (L.) and Tagetes minuta (L.). African J Agric Res. 2018 Aug 23;13(34):1754–60.

XXXI. Alen Y, Sari P, Aldi Y, Yulianis, Nakajima S, Baba N, et al. Extraction, fractionation and Cytotoxicity Test of Merremia peltata (L.) Merr., (Fam. Convolvulaceae) Leaves. Der Pharm Lett.

2016;8(11).

XXXII. RESTA H. UJI AKTIVITAS ANTIBAKTERI FRAKSI DAUN AKA LAMBUANG (Merremia peltata (L.) Merr.). 2012.

XXXIII. Khan MR, Omoloso AD. Antibacterial and antifungal activities of Breynia cernua. Fitoterapia. 2008 Jul;79(5):370–3.

XXXIV. Dirgantara S, Tanjung RHR, Maury HK, Meiyanto E. Cytotoxic Activity and Phytochemical Analysis of Breynia cernua from Papua. Indones J Pharm Sci Technol [Internet]. 2018 Jun 28;1(1):31–6. Available from: https://jurnal.unpad.ac.id/ijpst/article/view/16121

XXXV. Gunawan E, Dirgantara S, Simaremare ES, Pratiwi RD. Antibacterial Activity of Daun Jilat Extract (Villebrunea rubescens) Papua to Staphylococcus aureus and Escherichia coli Bacterial. Adv Sci Lett [Internet]. 2018 Mar 1;24(1):84–7. Available from: https://www.researchgate.net/publication/323481344_Antibacterial_Activity_of_Daun_Jilat_Extract_Villebrunea_rubescens_Papua_to_Staphylococcus_aureus_and_Escherichia_coli_Bacterial

XXXVI. Dimara L, Yenusi TY. Uji Aktivitas Antibakteri dan Antioksidan Ekstrak Pigmen Klorofil Rumput Laut Caulerpa racemosa (Forsskal) J.Agardh. J Biol PAPUA [Internet]. 2011 Oct 20;3(2):53–8. Available from: https://ejournal.uncen.ac.id/index.php/JBP/article/view/549

XXXVII. Chrystomo Linus Y., I.M. Budi, A.K. Karim, A. Pongtiku. Observasi klinik penggunaan tumbuhan obat Glochdion sp dalam bentuk teh celup untuk menyembuhkan penyakit malaria oleh masyarakat Papua. Prosiding Seminar Nasional Perhimpunan Biologi Indonesia (PBI) Ke-23, Universitas Cenderawasih, Jayapura. Tanggal 8-9. Prosiding Seminar Nasional Perhimpunan Biologi Indonesia (PBI) Ke-23. Universitas Cenderawasih, Jayapura.; 2015.

XXXVIII. Oktalia G, Chrystomo LY, Karim AK. Uji Aktivitas Sitotoksik dan Analisis Fitokimia Ekstrak Etanol Daun Sampare (Glochidion sp.). J Biol PAPUA. 2017 May 14;9(2):49–54.

XXXIX. Phulsagar S, Dundi M, Bhagwat S, Girigaon Y. An Inside Review of Myristica fragrans Houtt. A Potential Med Plant India. 2014;

XL. Saberi H. NUTMEG AND MACE. Bloom Handb Indian Cuis [Internet]. 2023 Jan 1;260. Available from: https://www.researchgate.net/publication/279434650_Nutmeg_and_mace

XLI. Liu F, Ng TB. Antioxidative and free radical scavenging activities of selected medicinal herbs. Life Sci [Internet]. 2000 Jan 14;66(8):725–35. Available from: https://www.researchgate.net/publication/223289774_Antioxidative_and_free_radical_scavenging_activities_of_selected_medicinal_herbs

XLII. Rija'i HR. UJI AKTIVITAS ANTIOKSIDAN EKSTRAK BERTINGKAT DAUN SIRIH HITAM (Piper acre Blume.) DENGAN PEREDAMAN RADIKAL BEBAS DPPH (1,1-difenil-2-pikril hidrazil) [Internet]. Universitas Islam Bandung; 2015. Available from: http://repository.unisba.ac.id:8080/xmlui/handle/123456789/2718

XLIII. Backer CA, Bakhuizen van den brink jr. Flora of Java. Netherland: 1 Wolters Noordhoof.V. Groningen; 1963. 170 p.

XLIV. Singh V, Raghav PK. Review on pharmacological properties of Caesalpinia bonduc L. 2012;

XLV. Assogbadjo AE, Glèlè-Kakaï R, Adjallala FH, Azihou AF, Vodouhê GF, Kyndt T, et al. Ethnic differences in use value and use patterns of the threatened multipurpose scrambling shrub (Caesalpinia bonduc L.) in Benin. J Med PLANTS Res [Internet]. 2011;5(9):1549–57. Available from: http://hdl.handle.net/1854/LU-1256575

XLVI. Sharma A, Bachheti RK. A REVIEW ON IPOMOEA CARNEA. Int J Pharma Bio Sci [Internet]. 2013;Volume 4 I(4):363–77. Available from: http://www.ijpbs.net/details.php?article=2724

XLVII. Mak-Mensah E, Komlaga G, Terlabi EO. Antiypertensive action of ethanolic extract of Imperata cylindrica leaves in animal models. J Med Plants Res. 2010;4(14).

XLVIII. Omoregie E, Pal A, Sisodia B. n Vitro Antimalarial and Cytotoxic Mensah MEE, Komlaga G, Terlabi EO. Antiypertensive action of ethanolic extract of Imperata cylindrica leaves in animal models. L Med Plants Resch. 2010;4(14).

XLIX. Hasan H, Ain Thomas N, Hiola F, Nuzul Ramadhani F, Ibrahim AS. Skrining Fitokimia dan Uji Aktivitas Antioksidan Kulit Batang Matoa (Pometia pinnata) Dengan Metode 1,1-Diphenyl-2 picrylhidrazyl (DPPH). Indones J Pharm Educ [Internet]. 2022 Mar 1;2(1):67–73. Available from: https://www.researchgate.net/publication/363213586_Skrining_Fitokimia_dan_Uji_Aktivitas_Antioksidan_Kulit_Batang_Matoa_Pometia_pinnata_Dengan_Metode_11-Diphenyl-2_picrylhidrazyl_DPPH

L. Ngibad K, Lestari LP. UJI FITOKIMIA DAN AKTIVITAS ANTIOKSIDAN EKSTRAK METANOL DAUN ZODIA (Evodia suaveolens). As-Syifaa J Farm [Internet]. 2019 Dec 1;11(2):161–8. Available from: https://jurnal.farmasi.umi.ac.id/index.php/as-syifaa/article/view/568

LI. Faisal AP, Rukmana Nasution P, Wakidi RF.

Aktivitas Antioksidan Dari Daun Bintangur (Calophyllum Inophyllum L.) Terhadap Radikal Bebas Dpph (1,1 Difenil-2-pikrihidrazil. J Ris Kefarmasian Indones [Internet]. 2022 Jan 27;4(1):1–10. Available from: https://www.neliti.com/id/publications/483872/

LII. Putri OK, Rahayu LO, Hadiwibowo GF, Manggarani RD. Pengaruh Metode Preparasi Ekstrak Daun Waru (Hisbicus tiliaceus) Sebagai Antioksidan Terhadap Kadar Flavonoid dan Fenolik Total. Akta Kim Indones [Internet]. 2021 Nov 30;6(2):162–73. Available from: https://iptek.its.ac.id/index.php/kimia/article/view/10801

LIII. Zuhra CF, Tarigan JB, Sihotang H. Aktivitas Antioksidan Senyawa Flavonoid DAri Daun Katuk (Sauropus androgunus (L) Merr.). J Biol Sumatra. 2008;3(1):10–3.

LIV. Setyaningsih D (Dwi), Pandji C (Chilwan), Perwatasari DD (Dayu). Kajian Aktivitas Antioksidan dan Antimikroba Fraksi dan Ekstrak dari Daun dan Ranting Jarak Pagar (Jatropha Curcas L.) Serta 126 Pemanfaatannya pada Produk Personal Hygiene. Agritech J Fak Teknol Pertan UGM [Internet]. 2014;34(2):126–37. Available from: https://www.neliti.com/publications/97816/

LV. Nafisah M, Tukiran. Uji Antioksidan dan Identifikasi Senyawa Aktif dari Ekstrak Kloroform Daun Tanaman Beluntas (*Pluchea indica L.*). UNESA J Chem. 2017;6(2):107–12.

LVI. Salim R. Uji Aktivitas Antioksidan Infusa Daun Ungu Dengan Metoda DPPH (1,1- diphenil- 2-picrylhidrazil). J Katalisator. 2018 Oct 31;3(2):153.

LVII. Cahyanto HA. Aktivitas Antioksidan Ekstrak Etanol Biji Pinang (Areca catechu, L). Maj BIAM. 2018;14(2):70.

LVIII. Utami YP. UJI AKTIVITAS ANTIOKSIDAN EKSTRAK ETANOL AKAR SAMBILOTO (Andrographis paniculata (Burm.F.) Ness.) DENGAN METODE DPPH. J Farm Medica/Pharmacy Med J [Internet]. 2021 Jul 6;4(1):20–3. Available from: https://ejournal.unsrat.ac.id/v2/index.php/pmj/article/view/34520

LIX. ZEBUA LI, PURNAMASARI V. OIL OF PANDAN KELAPA HUTAN (Pandanus jiulianettii Martelli): PHYSICOCHEMICAL PROPERTIES, TOTAL PHENOLS, TOTAL CAROTENE, VITAMIN E AND ANTIOXIDANT ACTIVITY. J Biol Udayana. 2018 Jan 26;21(2):71.

LX. Darmakusuma D, Kadang L, Mohammad Ariff Raja Hussin T, Karyawati AT, Manek SA, Payong VA, et al. AKTIVITAS ANTIOKSIDAN DAN KANDUNGAN FENOL TOTAL EKSTRAK METANOL BUAH HUEK (Eucalyptus alba). J Biotropikal Sains. 2019;16(1):80–4.

LXI. Lohita Sari B, Lily Elfrieda NSA, Marsuan K, Sapitri P, Hafidh A. AKTIVITAS ANTIOKSIDAN DAN STUDI IN SILICO EKSTRAK BUAH PALA (Myristica fragrans Houtt). J Farmamedika (Pharmamedica Journal). 2022 Jun 12;7(1):28–40.

LXII. Kurang RY, Malaipada NA. UJI FITOKIMIA DAN AKTIVITAS ANTIOKSIDAN EKSTRAK METANOL DAGING BUAH MAHKOTA DEWA (PHALERIA MACROCARPA). Sebatik. 2021 Dec 1;25(2):767–72.

LXIII. Putri NI, Hendrawan S, Ferdinal F. Uji fitokimia dan kapasitas total antioksidan ekstrak bunga kantong Semar (Nepenthes rafflesiana Jack). Tarumanagara Med J [Internet]. 2022 Nov 30 [cited 2026 May 24];4(2):310–5. Available from: https://www.researchgate.net/publication/382180892_Uji_fitokimia_dan_kapasitas_total_antioksidan_ekstrak_bunga_kantong_Semar_Nepenthes_rafflesiana_Jack

LXIV. Alim N, Jummah N, Pratama AS, Nurdiyanti N. Skirining fitokimia ekstrak etanol kulit buah sirsak (Annona muricata Linn) dan uji aktivitas antioksidan dengan metode DPPH. Sasambo J Pharm. 2021;2(2):60–4.

LXV. Suratno S, Rizki MI, Pratama MRF. In-Vitro Study of Antioxidant Activities from Ethanol Extracts of Akar Kuning (Arcangelisia flava). J Surya Med [Internet]. 2019 Feb 22;4(2):66–71. Available from: https://www.researchgate.net/publication/331870599_In-Vitro_Study_of_Antioxidant_Activities_from_Ethanol_Extracts_of_Akar_Kuning_Arcangelisia_flava

LXVI. Qulub MS, Wirasti W, Mugiyanto E. PERBEDAAN AKTIVITAS ANTIOKSIDAN EKSTRAK ETANOL DAUN, DAGING BUAH, DAN BIJI MENGKUDU (Morinda citrifolia L.) DENGAN METODE DPPH (1,1–DIPHENYL-2-PICRYLHYDRAZYL). Pros Univ Res Colloq [Internet]. 2019 Jan 21;454–62. Available from: https://repository.urecol.org/index.php/proceeding/article/view/381

LXVII. Abdelhakim IA, Abdel-baky AM, Bishay DW. In vitro evaluation of antioxidant activity of Caryota mitis Lour. Leaves extracts. J Pharmacogn Phytochem [Internet]. 2017 Oct 24;6(5):2559–62. Available from: https://www.phytojournal.com/archives/2017.v6.i5.2014/in-vitro-evaluation-of-antioxidant-activity-of-caryota-mitis-lour-leaves-extracts

LXVIII. Kartikasari R. Perbedaan Potensi Antioksidan Ekstrak Daun Girang (Leea Indica) dari Taman Nasional Meru Betiri dengan Pelarut N-Heksan, Etil Asetet, dan Metanol. Skripsi Universitas

Jember; 2015.

LXIX. Malik MN, Haq I ul, Fatima H, Ahmad M, Naz I, Mirza B, et al. Bioprospecting Dodonaea viscosa Jacq.; a traditional medicinal plant for antioxidant, cytotoxic, antidiabetic and antimicrobial potential. Arab J Chem. 2022;15(3):103688.

LXX. Buranasudja V, Rani D, Malla A, Kobtrakul K, Vimolmangkang S. Insights into antioxidant activities and anti-skin-aging potential of callus extract from Centella asiatica (L.). Sci Rep. 2021;11(1):1–16.

LXXI. Razafindrakoto ZR, Tombozara N, Donno D, Gamba G, Nalimanana NR, Rakotondramanana DA, et al. Antioxidant, analgesic, anti-inflammatory and antipyretic properties, and toxicity studies of the aerial parts of Imperata cylindrica (L.) Beauv. South African J Bot [Internet]. 2021 Nov 1;142:222–9. Available from: https://www.researchgate.net/publication/353260476_Antioxidant_analgesic_anti-inflammatory_and_antipyretic_properties_and_toxicity_studies_of_the_aerial_parts_of_Imperata_cylindrica_L_Beauv

LXXII. Manalu RT, Herdini, Danya F. INDONESIA Uji Aktivitas Antioksidan Ekstrak Etanol dan Fraksi Daun Gedi hijau Antioxidant Activity Test Of Ethanol Extract And Fraction Of The Leaves Of (Abelmoschus manihot (L .) Medik) With DPPH (1 , 1-Diphenyl-2-Pikrilhidrazil) Method. Pharm J Indones. 2022;8(1):17–23.

LXXIII. Kuntorini EM, Nugroho LH, Maryani, Nuringtyas TR. Anatomical structure, flavonoid content, and antioxidant activity of Rhodomyrtus tomentosa leaves and fruits on different age and maturity level. Biodiversitas. 2019;20(12):3619–25.

LXXIV. Sekarsari S, Widarta IWR, Jambe AAGNA. PENGARUH SUHU DAN WAKTU EKSTRAKSI DENGAN GELOMBANG ULTRASONIK TERHADAP AKTIVITAS ANTIOKSIDAN EKSTRAK DAUN JAMBU BIJI (Psidium guajava L.). J Ilmu dan Teknol Pangan. 2019;8(3):267.

LXXV. Shukla R. Study of Phytochemical Investigation and in Vitro Antioxidant Potential of Hydroalcoholic Extract of Barleria Prionitis. IjpdrCom. 2019;7(2):73–8.

LXXVI. Priyanto A, Islamiyati R. Uji Aktivitas Antioksidan Pada Batang Tebu Hijau Dan Batang Tebu Merah Menggunakan Metode Peredaman Radikal Bebas Dpph. Cendekia J Pharm. 2018;2(1):50–9.

LXXVII. Dewi RS, Made N, Sandhiutami D, Sarsono DA, Cuinita DP. Antioxidants and Antihyperlipidemia Test of Ethanol Extract of Indonesian Plant Sambang Getih Leaves (Hemigraphis Bicolor Boerl .) In Hyperlipidemia Mice. 2023;11:92–8.

LXXVIII. Quirós-Fallas MI, Vargas-Huertas F, Quesada-Mora S, Azofeifa-Cordero G, Wilhelm-Romero K, Vásquez-Castro F, et al. Polyphenolic HRMS Characterization, Contents and Antioxidant Activity of Curcuma longa Rhizomes from Costa Rica. Antioxidants. 2022;11(4).

LXXIX. Susanti EP, Rohman A, Setyaningsih W. Dual Response Optimization of Ultrasound-Assisted Oil Extraction from Red Fruit (Pandanus conoideus): Recovery and Total Phenolic Compounds. Agronomy. 2022;12(2).

LXXX. Wawo AH, Lestari P, Setyowati N. Buah Merah (Pandanus conoideus Lamk) Bioresources Pegunungan Tengah Papua : Keanekaragaman dan Upaya Konservasinya (The red fruit (Pandanus conoideus Lamk) is one of the bioresources at the Central Highlands Region of Papua : Divertsity and Conservat. J Biol Indones. 2019;15(1):107–21.

LXXXI. Purnamasari V, Lunga N, Widjanarko SB. Morphometric characteristic, nutritional value and antioxidant activity of sararanga sinuosa hemsley (Pandanaceae) during ripening: A native berries of papua, Indonesia. Pakistan J Bot. 2020;52(2):427–33.