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MEDICINAL PLANTS USED BY THE DAYAK KAYONG COMMUNITY, KETAPANG REGENCY, INDONESIA

R.G.P. PANJAITAN[1*], K.G. LAURENSA[1], E.S. WAHYUNI[1], M.W. ALAM[2], and AFANDI[1]

Biology Education, Faculty of Teacher Training and Education, Tanjungpura University, Pontianak, Indonesia
[2]King Saud University Riyadh, Saudi Arabia
*Corresponding author's email: ruqiah.gpp@fkip.untan.ac.id
Email addresses of co-authors: klaralaurensa@student.untan.ac.id, eko.sri.wahyuni@fkip.untan.ac.id, walam.c@ksu.edu.sa, afandi@fkip.untan.ac.id

SUMMARY

In the present era, medicinal plants' use is one of the local wisdom held by the Dayak Kayong community living in Tajok Kayong Village, Nanga Tayap Sub-District, Ketapang Regency, Indonesia. Accordingly, the related study aimed to gather and document the relevant information about various medicinal plant species and their use for prevention and treatment of numerous diseases. Using a qualitative method, analysis of all collected information ensued through different interviews, observations, and documentation. Overall, 28 plant species existed as used by the Dayak Kayong community for traditional medicines. The plant species applied as traditional medicine belong to the 19 different families, i.e., Acanthaceae, Apocynaceae, Araceae, Asparagaceae, Asteraceae, Chrysobalanaceae, Crassulaceae, Fabaceae, Iridaceae, Lamiaceae, Malvaceae, Menispermaceae, Moraceae, Myrtaceae, Piperaceae, Poaceae, Rubiaceae, Simaroubaceae, and Zingiberaceae. Furthermore, the most used plant parts were the leaves, and the predominant processing method was boiling of plant leaves followed by drinking the boiled water.

Keywords: Dayak Kayong community, local wisdom, medicinal plants, Tajok Kayong, traditional medicines, prevention and treatment of diseases

Key findings: The presented research provides information about the diverse species of plants used as traditional medicines. Research results detailed insight on using medicinal plants in curing various diseases.

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INTRODUCTION

Indonesia is a known mega biodiversity country due to abundance of the flora and fauna (Panjaitan *et al.*, 2021; Sanka *et al.*, 2023). The available biodiversity holds greater potential as a source of food and medicines (Panjaitan *et al.,* 2020). For prevention and treatment of various diseases, the diverse species of medicinal plants with varied parts can be applicable, including 'ketepeng' leaves (Fadhlurrahman *et al.,* 2023), 'bawang dayak' (Muti'ah *et al*., 2020), and 'sembung' leaves (Siregar *et al.*, 2023) as antibacterial, anticancer, and antibiotics, respectively. The different plants used as medicines vary in different regions based on the diversity of ethnic groups and culture in Indonesia (Panjaitan *et al.*, 2020, 2021). Several previous studies have transpired regarding employing plants as medicines on several islands in Indonesia, including research on the Kalimantan Island, Indonesia (Ratnasari *et al.,* 2017; Santoso *et al.*, 2019; Panjaitan *et al.*, 2020; Panjaitan *et al.*, 2021) and on the island of Sumatra, Indonesia (Yassir and Asnah, 2018; Malo *et al.*, 2017; Lestari and Susanti, 2019). Medicinal plants are highly diverse and can prevail in numerous regions, including West Kalimantan (Maharani *et al.,* 2021; Pirmansyah *et al.,* 2023).

West Kalimantan province sits on Kalimantan Island, comprising two cities, namely, Pontianak and Singkawang. The said province also has 12 regencies, including Bengkayang, Sambas, Sekadau, Landak, North Kayong, Mempawah, Kubu Raya, Sanggau, Sintang, Melawi, Kapuas Hulu, and Ketapang. Nanga Tayap is one of the subdistricts in Ketapang Regency, Indonesia, with several villages dividing it, including Tajok Kayong. This village covers an area of approximately 52.6433 km^2, with a population of 614 males and 565 females, totaling 1,179 inhabitants, and all of them belong to the Dayak Kayong community.

The Dayak Kayong community continues to uphold the local wisdom inherited from their ancestors, including the use of medicinal plants as an alternative and traditional treatment (Panjaitan *et al.*, 2021). Plant species applied in traditional medicines have respective properties, such as, facilitating breast milk production after childbirth. These also treat gastritis, breast cancer, liver disorders, skin diseases, menstrual pain, high cholesterol, bone fractures, fever, wounds, gout, hypertension, diarrhea, constipation, vaginal discharge, hemorrhoids, toothaches, bloody stools, and back pain.

For effective use, the Dayak Kayong community independently processes the medicinal plants as traditional remedies at home. However, the community visiting village healers is common due to the perceived understanding of plants' usage as traditional prescriptions according to the disease. This implies local wisdom depends on the community practices in traditional prevention and treatment of various diseases as per the knowledge held by each community (Panjaitan *et al.,* 2021).

Currently, the knowledge regarding the use of medicinal plants as medications in Tajok Kayong Village is only transferrable verbally, with no written document, raising fear of its extinction with time. Therefore, the potential study aimed to gather and document all those relevant information about the medicinal plant species used by the Dayak Kayong community in Tajok Kayong Village, Ketapang Regency, Indonesia.

MATERIALS AND METHODS

The presented study on the medicinal plant species happened from July to August 2023 in Tajok Kayong Village, Nanga Tayap Subdistrict, Ketapang Regency, West Kalimantan, Indonesia (Figure 1). The study used the qualitative method with triangulation techniques, by combining all the data based on interviews, observations, and documentation (Sugiyono, 2019). The research comprised four stages : data collection, plant sampling, herbarium making, and identification. The first stage is data collection by conducting field observations using triangulation techniques. The activity began with determining informants using the purposive sampling technique, where five informants are village healers and native

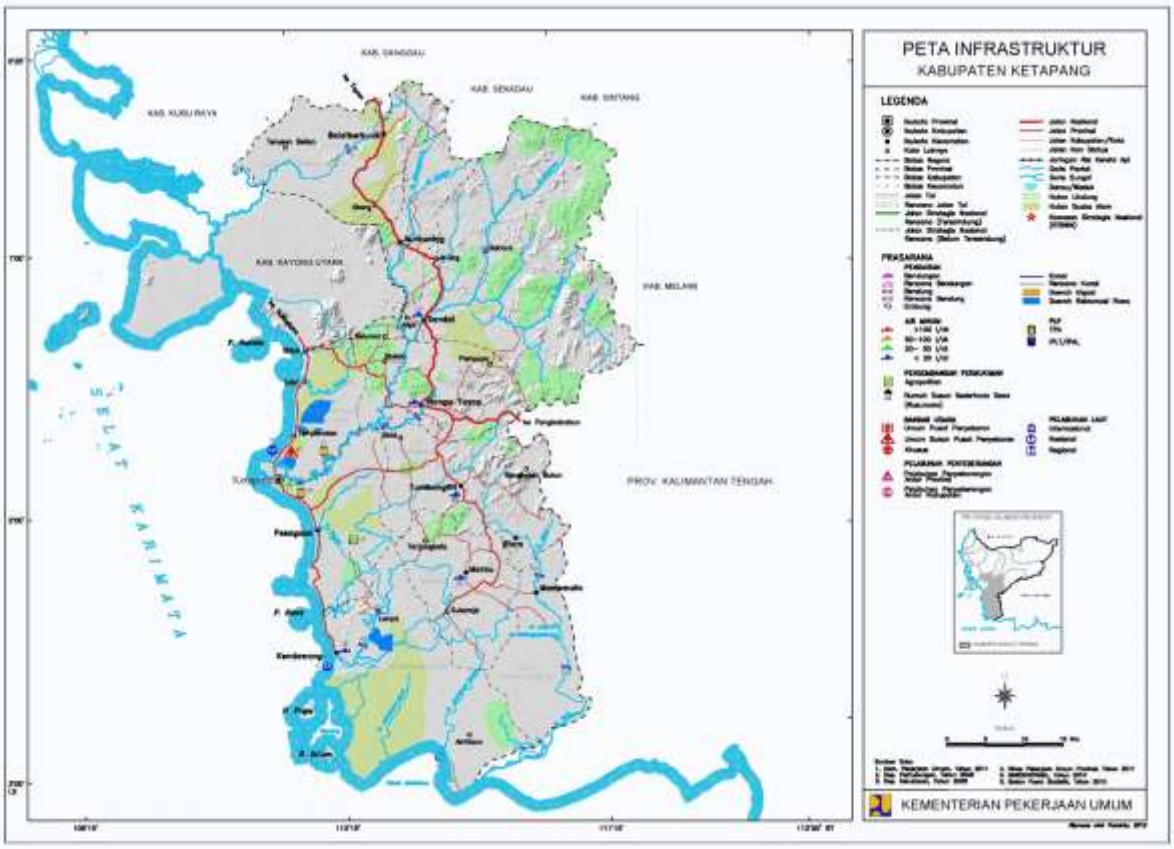

Figure 1. Map of Ketapang Regency, West Kalimantan, Indonesia (Source: https://ketapangkab.bps.go.id/id/publication/2024/02/28/4edcddf9bf0910d164d0cd74/kabupaten-ketapang-dalam-angka-2024.html).

residents of the Dayak Kayong community in Tajok Kayong Village. Interviews conducted in this study used a structured technique with an interview sheet containing information about the types of plants, their benefits, the parts used, and how to process them. Afterward, field observations and plant documentation proceeded using a camera. The second stage is the collection of plants with medicinal properties based on the results of interviews with village healers regarding the plant types. The third stage is making a dry herbarium on the taken plants. The fourth stage is herbarium identification carried out at the Biology Laboratory, Faculty of Mathematics and Natural Sciences, Tanjungpura University Pontianak, with letter numbers 156/A/LB/FMIPA/UNTAN/2023 and 159/A/LB/FMIPA/UNTAN/2023.

RESULTS AND DISCUSSION

Based on the results of interviews conducted in Tajok Kayong Village, Nanga Tayap Subdistrict, Ketapang Regency, West Kalimantan, Indonesia, 28 plant species emerged as often utilized by the Kayong Dayak community as traditional medicine (Tables 1 and 2, Figure 2). The plants found were cultivated plants (29%) and wild plants (71%). These plants can be existing in home yards, fields, high mountains, forests, and gardens. Most of these plant species belong to the Zingiberaceae family. According to previous scientific data, identifying plant species belonging to the Zingiberaceae family is easy, and they can grow in various humid environments, such as, home yards, rivers, forests, and clay soils (Dalisay *et al.*, 2018).

Table 1. Plants with common and scientific names, family, and their benefits as medicinal plant used by the Dayak Kayong community in Tajok Kayong Village, Indonesia.

No.	Family	Local names/Scientific name	Plant Part	Disease Treated
1.	Acanthaceae	*Gandarusa / Justicia gendarussa* Burm. fil.	Leaves and stems	Bone fractures
2.	Acanthaceae	*Sambiloto / Andrographis paniculata* (Burm. Fil.) Nees	Leaves	Fever
3.	Apocynaceae	*Pulai / Alstonia scholaris* (L.) R. Br.	Sap	Pain in cavitated teeth
4.	Araceae	*Perapat patah / Monstera* sp.	Leaves	Bone fractures
5.	Asparagaceae	*Andong merah / Cordyline fruticosa* (L.) A.Chev.	Leaves	Bloody stools
6.	Asteraceae	*Sembung / Blumea balsamifera* (L.) DC.	Leaves	Fever and colds in infants
7.	Chrysobalanaceae	*Rusu / Licania* sp.	Leaves	Skin diseases, such as, boils
8.	Crassulaceae	Cocor bebek */ Kalanchoe pinnata* (Lam.) Pers	Leaves	Infections and accelerates wound healing
9.	Fabaceae	*Jengkol / Archidendron jiringa* (Jack.) I.C. Nielsen	Bark	Accelerates wound healing
10.	Fabaceae	Ketepeng */ Cassia alata* (L.) Roxb	Leaves	Skin diseases, such as. itching, ringworm, tinea versicolor, and scabies
11.	Iridaceae	*Bawang dayak / Eleutherine bulbosa* (Mill.) Urb.	Cloves	Breast cancer
12.	Lamiaceae	*Kumis kucing / Orthosiphon aristatus* (Blume) Miq	Roots, stems, and leaves	Lower back pain
13.	Malvaceae	*Durian / Durio zibethinus* Murray.	Bark	Constipation
14.	Menispermaceae	*Brotowali /Tinospora crispa* (L.) Miers ex Hook. fil. & Thomson	Stem	Fever and lowers blood sugar levels
15.	Moraceae	*Nyawai / Ficus* sp.	Leaves	Facilitates breast milk production after childbirth
16.	Myrtaceae	*Salam / Syzygium* sp.	Leaves	Treats gout and hypertension
17.	Myrtaceae	*Jambu biji / Psidium guajava* L.	Leaves	Diarrhea
18.	Piperaceae	*Sirih hijau / Piper betle* L.	Leaves	Vaginal discharge and aids postpartum recovery
19.	Piperaceae	*Sirih merah / Piper crocatum* Ruiz & Pav	Leaves	Hemorrhoids and hypertension
20.	Poaceae	Serai */ Cymbopogon nardus* (L.) Rendle.	Stalks	Bone fractures and joint pain
21.	Rubiaceae	*Mengkudu / Morinda citrifolia* L.	Leaves	Cholesterol and hypertension
22.	Simaroubaceae	*Buah makassar / Brucea* sp.	Kernels	Constipation and diarrhea
23.	Zingiberaceae	*Kunyit / Curcuma longa* L.	Rhizomes	Facilitates breast milk production after childbirth
24.	Zingiberaceae	*Kunyit putih / Curcuma zedoaria* (Christm.) Roscoe	Rhizomes	Gastritis and breast cancer
25.	Zingiberaceae	*Temulawak / Curcuma xanthorrhiza* Roxb.	Rhizomes	Liver disorders (cirrhosis, liver, and hepatitis)
26.	Zingiberaceae	*Lengkuas / Alpinia galanga* (L.) Willd.	Rhizomes	Skin diseases, such as, itching, ringworm, tinea versicolor, and scabies
27.	Zingiberaceae	*Jahe / Zingiber officinale* Roscoe	Rhizomes	Facilitates breast milk production after childbirth
28.	Zingiberaceae	*Jahe merah / Zingiber officinale var* Rubrum	Rhizomes	Relieves menstrual pain and lowers cholesterol

Table 2. Plant with common and scientific names and their processing methods used by the Dayak Kayong community in Tajok Kayong Village, Indonesia.

No.	Plant Name	Scientific Name	Processing Method
1.	*Gandarusa*	*Justicia gendarussa* Burm. fil.	Take 2-3 shoots of *gandarusa* plant including leaves and stems, then heat over the fire, and place them on the injured body part.
2.	*Sambiloto*	*Andrographis paniculata* (Burm. Fil.) Nees	Take 7-8 old *sambiloto* leaves, then boil, and drink the boiled water.
3.	*Pulai*	*Alstonia scholaris* (L.) R. Br.	Take 3-4 drops of *pulai* plant sap, then apply it to the painful or cavitated tooth.
4.	*Perapat patah*	*Monstera* sp.	Take 2-3 old *perapat patah* leaves and heat over the fire, then place on the injured body part.
5.	*Andong merah*	*Cordyline fruticosa* (L.) A.Chev.	Take 1-2 old *andong merah* leaves, then boil, and drink the boiled water.
6.	*Sembung*	*Blumea balsamifera* (L.) DC.	Take 3-4 old *sembung* leaves, then boil, and drink the boiled water or crush the leaves and mix with water for bathing.
7.	*Rusu*	*Licania* sp.	Take 3-4 old *rusu* leaves, then heat over the fire, and place on the skin.
8.	*Cocor bebek*	*Kalanchoe pinnata* (Lam.) Pers	Take 3-4 old *cocor bebek* leaves, then crush, and place on the skin.
9.	*Jengkol*	*Archidendron jiringa* (Jack.) I.C. Nielsen	Take a 5-10 cm piece of *jengkol* plant bark, then grate it and place it on the skin.
10.	*Ketepeng*	*Cassia alata* (L.) Roxb	Take 6-7 old *ketepeng* leaves, then pound or crush, and place on the skin.
11.	*Bawang dayak*	*Eleutherine bulbosa* (Mill.) Urb.	Take 4-5 *bawang dayak* cloves, then boil, and drink the boiled water.
12.	*Kumis kucing*	*Orthosiphon aristatus* (Blume) Miq	Take 1-2 shoots of *kumis kucing* plant including roots, stems, and leaves, then boil and drink the boiled water.
13.	*Durian*	*Durio zibethinus* Murray.	Take a 5-10 cm piece of *durian* plant bark, then boil it, and drink the boiled water.
14.	*Brotowali*	*Tinospora crispa* (L.) Miers ex Hook. fil. & Thomson	Take a 5-10 cm piece of *brotowali* plant stem, then boil it, and drink the boiled water.
15.	*Nyawai*	*Ficus* sp.	Take 10-11 young *nyawai* leaves, then add ginger and cook like clear soup.
16.	*Salam*	*Syzygium* sp.	Take 6-7 old *salam* leaves, then boil, and drink the boiled water.
17.	*Jambu biji*	*Psidium guajava* L.	Take 5-6 old *jambu biji* leaves, then boil, and drink the boiled water.
18.	*Sirih hijau*	*Piper betle* L.	Take 5-6 old *sirih hijau* leaves, then boil, and drink the boiled water.
19.	*Sirih merah*	*Piper crocatum* Ruiz & Pav	Take 5-6 *sirih merah* leaves, then boil, and drink the boiled water.
20.	*Serai*	*Cymbopogon nardus* (L.) Rendle.	Take 2-3 stalks of *serai*, then crush, and place on the skin.
21.	*Mengkudu*	*Morinda citrifolia* L.	Take 6-7 young or old *mengkudu* leaves, then boil, and drink the boiled water.
22.	*Buah makassar*	*Brucea* sp.	Take 3-4 *makassar* kernels, then crack the fruit peel, and consume the seeds directly.
23.	*Kunyit*	*Curcuma longa* L.	Take 6-12 finger-sized *kunyit* rhizomes, then grate, and drink the juice.
24.	*Kunyit putih*	*Curcuma zedoaria* (Christm.) Roscoe	Take 6-12 finger-sized *kunyit putih* rhizomes, then grate, and drink the juice.
25.	*Temulawak*	*Curcuma xanthorrhiza* Roxb.	Take 6-12 finger-sized *temulawak* rhizomes, then grate, and drink the juice.
26.	*Lengkuas*	*Alpinia galanga* (L.) Willd.	Take 3-6 finger-sized *lengkuas* rhizomes, crush, and rub them on the skin.
27.	*Jahe*	*Zingiber officinale* Roscoe	Take 6-9 finger-sized *jahe* rhizomes, then crush and consume directly or mix with *nyawai* leaves, and cook into clear soup.
28.	*Jahe merah*	*Zingiber officinale var* Rubrum	Take 6-12 finger-sized *jahe merah* rhizomes, grate, and drink the juice.

Figure 2. Medicinal plant species based on plant inventory results in Tajok Kayong Village, Nanga Tayap Subdistrict, Ketapang Regency, Indonesia: 1. *Gandarusa* (*Justicia gendarussa* Burm. fil.), 2. *Sambiloto* (*Andrographis paniculata* [Burm. Fil.] Nees), 3. *Pulai* (*Alstonia scholaris* [L.] R. Br.), 4. *Perapat patah* (*Monstera* sp.), 5. *Andong merah* (*Cordyline fruticosa* [L.] A.Chev.), 6. *Sembung* (*Blumea balsamifera* [L.] DC.), 7. *Rusu* (*Licania* sp.), 8. *Cocor bebek* (*Kalanchoe pinnata* [Lam.] Pers.), 9. *Jengkol* (*Archidendron jiringa* [Jack.] I.C. Nielsen), 10. *Ketepeng* (*Cassia alata* [L.] Roxb), 11. *Bawang dayak* (*Eleutherine bulbosa* [Mill.] Urb.), 12. *Kumis kucing* (*Orthosiphon aristatus* [Blume] Miq.), 13. *Durian* (*Durio zibethinus* Murray.), 14. *Brotowali* (*Tinospora crispa* [L.] Miers ex Hook. fil. & Thomson), 15. *Nyawai* (*Ficus* sp.), 16. *Salam* (*Syzygium* sp.), 17. *Jambu biji* (*Psidium guajava* L.), 18. *Sirih hijau* (*Piper betle* L.), 19. *Sirih merah* (*Piper crocatum* Ruiz & Pav.), 20. *Serai* (*Cymbopogon nardus* [L.] Rendle.), 21. *Mengkudu* (*Morinda citrifolia* L.), 22. *Buah makassar* (*Brucea* sp.), 23. *Kunyit* (*Curcuma longa* L.), 24. *Kunyit putih* (*Curcuma zedoaria* [Christm.] Roscoe), 25. *Temulawak* (*Curcuma xanthorrhiza* Roxb.), 26. *Lengkuas* (*Alpinia galanga* [L.] Willd.), 27. *Jahe* (*Zingiber officinale* Roscoe), and 28. *Jahe merah* (*Zingiber officinale var* Rubrum).

The Tajok Kayong Village community mainly uses plant parts, such as, roots, rhizomes, bulbs, leaves, stems, bark, and seeds, as traditional medicines. However, plant leaves are the most used parts. In a past study conducted at Sumber Gadung Hamlet, Slateng Village, Jember Regency, Indonesia, the leaves emerged as the most used plant parts in traditional medicines. A past study supported these findings showing leaves are easily available and have rapid regeneration processes; hence, leaf harvesting does not significantly impact the plants' sustainability (Maharani *et al.,* 2021). Moreover, leaves contain various bioactive compounds (Santoso *et al.,* 2019) and secondary metabolite compounds, which play a vital role in biological activities (Utami and Jariah, 2023).

Each plant species has specific processing methods, viz., boiling, applying topically, and plastering onto the skin, grating, consuming directly, and cooking as a soup (Tables 1 and 2, Figure 2). In Tajok Kayong Village, medicinal plants' processing mostly occurred by boiling, and then, drinking the boiled water. These observations are greatly analogous to previous studies showing boiling plants leads to faster reactions compared with other methods because boiling is easier to perform and allows for more extraction of compounds (Pirmansyah *et al.,* 2023).

Medicinal plants used by the Dayak Kayong community contain various secondary metabolites, which can prevent and treat various diseases. From the results, the stem and leaves of the 'gandarusa' (*Justicia gendarussa* Burm. fil.) served to treat bone fractures. According to past studies, 'gandarusa' leaves contain tannins, saponins, and flavonoids, with potential antioxidant properties effective for treating bone fractures (Wilsya *et al.,* 2020).

'Sambiloto' (*Andrographis paniculata* [Burm. Fill.] Nees) is traditionally for treating fever by the community in Tajok Kayong Village. Furthermore, the 'sambiloto' leaves were also means for the community in Lampo Village, Donggala Regency, to treat the diabetes mellitus due to the presence of active compounds, such as, andrographolide, capable of reducing blood glucose levels (Tandi *et al.,* 2023). 'Pulai' (*Alstonia scholaris* [L.] R. Br.) is a common treatment for toothaches and mouth ulcers used by Tajok Kayong community. The bark reportedly contains compounds, including tannins, alkaloids, and flavonoids, which have potential antibacterial properties (Candrasari *et al.*, 2018).

'Perapat patah' (*Monstera* sp.) has the community in Tajok Kayong Village applying it for bone fractures. However, no past study has materialized on 'perapat patah' regarding their metabolite compounds. Although, a previous study stated 'perapat patah' belongs to the *Monstera* genus, comprising several species, including *Monstera deliciosa* Liebm., serving as traditional medicine for healing burnt wounds and bruises for a community in Petrus Kafiar Village, Manokwari Regency, West Papua (Maturahmah *et al.*, 2023).

'Andong merah' (*Cordyline fruticosa* [L.] A. Chev.) helps treat bloody stools. Based on previous studies, the 'andong merah' leaves reportedly contain compounds, i.e., tannins, flavonoids, saponins, and triterpenoids, which have potential antioxidant and antibacterial properties (Utami and Jariah, 2023). 'Sembung' (*Blumea balsamifera* [L.] DC.) is a traditional treatment for different types of fever and flu in infants. An earlier study also declared 'sembung' leaves contain alkaloids, tannins, flavonoids, and steroids, with a great potential as antibiotics, anti-inflammatory, diuretic, and analgesic agents (Siregar *et al.*, 2023).

'Rusu' (*Licania* sp.) is a traditional medicine of the community in Tajok Kayong Village to treat skin diseases by boiling the leaves, and then, placing on the skin. However, no past study has surfaced regarding the metabolite compounds found in 'rusu.' A previous study said 'rusu' belongs to the genus *Licania*, which comprises several species, including *Licania laxiflora* Fritsch, used by the Amazon community as an antibiotic and for treating dysentery (Gemaque *et al.*, 2021).

'Cocor bebek' (*Kalanchoe pinnata* [Lam.] Pers.) serves to treat infections and accelerate wound healing. A previous study reported the leaves of 'cocor bebek' contain steroids, flavonoids, tannins, and phenols, which are potential antibacterial agents (Sylvia

et al., 2020). 'Jengkol' (*Archidendron jiringa* [Jack.] I.C. Nielsen) is one of the important plants consumed directly as food. Traditionally, the community in Tajok Kayong Village used its bark to accelerate wound healing. From an earlier study, 'jengkol' fruit peel reportedly contains bioactive compounds, such as, phenols, saponins, flavonoids, and tannins, potentially accelerating wound healing (Hidayah *et al.,* 2019).

'Ketepeng' (*Cassia alata* [L.] Roxb.) traditionally serves to treat skin diseases in the Tajok Kayong Village, including itching, ringworm, tinea versicolor, and scabies, by crushing the plant leaves and placing on the skin. The 'ketepeng' leaves contain flavonoids, tannins, alkaloids, saponins, terpenoids, steroids, and phenols, effective as antiparasitic agents capable of treating inflammatory skin diseases, scabies, ringworm, tinea versicolor, herpes, syphilis, bronchitis, malaria, and constipation (Fadhlurrahman *et al.,* 2023).

'Bawang dayak' (*Eleutherine bulbosa* [Mill.] Urb.) is a traditional cure for breast cancer used by the community in Tajok Kayong Village. Additionally, the bulbs were applicable treatments for the Chinese, Dayak, and Malay communities in West Kalimantan to treat jaundice (Panjaitan *et al.,* 2021). These findings were also consistent with a past study showing 'bawang dayak' bulbs have flavonoids, used as anti-cancer activity (Muti'ah *et al.*, 2020).

'Kumis kucing' (*Orthosiphon aristatus* [Blume] Miq.) is a traditional medicine helping treat the lower back pain. Moreover, by consuming the decoction of roots, stems, and leaves, can also treat bladder calculi, vaginal discharge urinary pain, back pain, menstruation, rheumatism, and diabetes (Pirmansyah *et al.,* 2023). These findings gain support from scientific data that 'kumis kucing' leaves contain flavonoids with potential antioxidant properties (Salasa *et al.,* 2021).

Durian (*Durio zibethinus* Murray.) has the community in Tajok Kayong Village apply this to treat constipation problem. The durian fruit peel reportedly contains phenolic compounds, saponins, flavonoids, and tannins with potential antibacterial properties (Lestari *et al.,* 2020). 'Brotowali' (*Tinospora crispa* [L.] Miers ex Hook. fil. and Thomson) serves as a common medicine to treat fever and reduce blood sugar levels. The 'brotowali' stems have reports of saponin, flavonoid, terpenoid, and alkaloid contents with potential antioxidant properties (Roni *et al.*, 2022).

'Nyawai' (*Ficus* sp.) is one of the plants traditionally used by the community in Tajok Kayong Village to facilitate and boost breast milk production after childbirth by boiling as a soup. 'Nyawai' fruits reportedly contain secondary metabolites, such as, alkaloids and saponins with potential anticancer, antioxidant, and larvicidal properties (Lee, 2020).

'Salam' (*Syzygium* sp.) helps treat gout and hypertension as used traditionally by the Tajok Kayong Village community. The plant Salam leaves considerably contain compounds, such as, saponins, essential oils, tannins, and flavonoids with potential antihypertensive, antioxidant, cholesterol-lowering, anti-hyperglycemic, antibacterial, and anti-inflammatory properties (Widiyono *et al.,* 2020).

'Jambu biji' (*Psidium guajava* L.) helps the Tajok Kayong Village community to treat diarrhea. A report stated the 'Jambu biji' leaves contain alkaloids, tannins, essential oils, and flavonoids with potential antibacterial properties (Abshor and Basuki, 2019). 'Sirih hijau' (*Piper betle* L.) effectively treats vaginal discharge and as a postpartum medicine. A previous study detailed the 'sirih hijau' leaves contain saponins, flavonoids, polyphenols, essential oils, phenolic compounds, gallic acid, eugenol, and chlorogenic acid, which function as antioxidants (Maharani *et al.,* 2021).

'Sirih merah' (*Piper crocatum* Ruiz & Pav) is a traditionally used plant by the community in Tajok Kayong Village to treat hemorrhoids and hypertension. Additionally, the 'sirih merah' leaves contain flavonoids, alkaloids, tannins, and saponins, also used by the community in Lampo Village, Donggala Regency, to treat diabetes mellitus (Tandi *et al.,* 2023). 'Serai' (*Cymbopogon nardus* [L.] Randle.) is a common treatment for bone fractures and joint pains. Similarly, the community in Petrus Kafiar Village, Manokwari Regency, West Papua, used the boiled lemon grass water to alleviate pains, coughs, and

diarrhea (Unuigbe *et al*., 2019; Maturahmah *et al.,* 2023). The 'serai' leaves reportedly have alkaloids, terpenoids, and phenolic compounds, with potential antioxidant and anti-inflammatory properties (Pirmansyah *et al.,* 2023).

'Mengkudu' (*Morinda citrifolia* L.) is a traditional medicine used to treat hypertension and high cholesterol level. The 'mengkudu' fruits exhibited containing compounds, including xeronine, scopoletin, and proxeronine, with the potential to act as antihypertensive and antifungal agents (Wahyudi *et al.,* 2022). 'Buah makassar' (*Brucea* sp.) typically treats diarrhea and constipation by consuming its seeds. The 'buah makassar' compounds include triterpenoids, tannins, alkaloids, and saponins, which have the potential to act as antioxidants agents (Jacob *et al.*, 2020).

'Kunyit' (*Curcuma longa* L.) is traditionally effective to induce breast milk production after childbirth. The 'Kunyit' rhizomes reportedly contain essential oils, alkaloids, flavonoids, tannins, polyphenols, triterpenoids, and steroids, which act as antioxidants (Pirmansyah *et al.,* 2023). 'Kunyit putih' *(Curcuma zedoaria* [Christm.] Roscoe) serves as a traditional medicine to treat gastritis and breast cancer. 'Kunyit putih' rhizomes also contain secondary metabolites, including essential oils, curcuminoids, flavonoids, steroids, tannins, and saponins, acting as anticancer agents and antioxidants (Phong *et al*., 2022).

'Temulawak' (*Curcuma xanthorrhiza* Roxb.), as a traditional medicine, treats liver disorders, including cirrhosis, liver, and hepatitis. Additionally, 'temulawak' is also a medication used by the Chinese, Dayak, and Malay communities in West Kalimantan to treat jaundice (Panjaitan *et al.*, 2021). The 'temulawak' rhizomes reportedly contain essential oils, starch, and curcumin, serving as anti-inflammatory, antivirus, antioxidant, antibacterial, and hepatoprotective agents (Syamsudin *et al.,* 2019). The 'lengkuas' (*Alpinia galanga* [L.] Willd.) is traditionally a treatment for skin diseases, such as, itching, ringworm, tinea versicolor, and scabies. Past studies also reported the 'lengkuas' rhizomes contain saponins, flavonoids, alkaloids, and phenols. These compounds have the potential to act as anti-inflammatory, hepatoprotective, antioxidant, antidiabetic, antibacterial, and antimicrobial agents (Badriyah *et al.,* 2023).

'Jahe' (*Zingiber officinale* Roscoe) typically facilitates breast milk production after childbirth. These 'jahe' effects refer to the essential oils that can help induce the breast milk production, as well as, controlling coughing, overcoming nausea, stomach ache, wounds, and internal heat (Al-Nema and Abdullah, 2023; Pirmansyah *et al.,* 2023). 'Jahe merah' *(Zingiber officinale* var Rubrum) traditionally aids to relieve menstrual pain and lower cholesterol level. The 'jahe merah' rhizomes reportedly contain alkaloids, phenolics, steroids, saponins, and glycosides (Phong *et al*., 2022). 'Jahe merah' rhizomes also serve the community in Karya Usaha Hamlet, Kubu Raya, West Kalimantan, in eliminating body odor, treating jaundice and ulcers, increasing appetite, maintaining endurance, cure for itching, treating flatulence, and anti-inflammatory, antioxidant, and healing toothache (Panjaitan *et al.*, 2020; Khedr *et al.*, 2024; Panjaitan *et al*., 2024).

CONCLUSIONS

The Kayong Dayak people in Tajok Kayong Village, Ketapang Regency, Indonesia, utilize 28 species belonging to 19 plant families for medicinal purposes, and most of them belong to the Zingiberaceae family. Plant organs used are roots, rhizomes, tubers, leaves, stems, bark, seeds, and all parts of plant organs. Each type of plant has its processing method, such as, boiling, smearing, taping, grating, drinking or consumed directly, and cooked into vegetables. Therefore, the use of medicinal plants to treat various diseases needs preservation as local wisdom owned by the community.

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