Ethnobotanical Study of Early Childhood Medicinal Plants Used by the Local People in South Bangka Regency, Indonesia

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Abstract. South Bangka Regency has a long history of using medicinal plants as part of its medical system. However, the potential associated with this aspect of traditional medicine remains understudied and poorly explored. This study aimed to describe the types of medicinal plants and analyze the use of medicinal plants to treat early childhood disease by the local community of South Bangka Regency. The research method used was open interview with local people using the questionnaires. The data was analyzed using Use Value (UV), Fidelity Level (FL), and Relative Frequency of Citation (RFC). The analysis identified 55 plant species from 35 families. The most common families were Euphorbiaceae (8.92%), Fabaceae (7.14%), Poaceae (7.14%), Zingiberaceae (5.36%), and Lamiaceae (5.36%). The most widely used plant was shallot plants (Allium cepa L.) with values of UV, FL, and RFC were 0.67, 66.67, and 0.015, respectively. This study revealed the richness of ethnomedicinal knowledge in the South Bangka Regency. Finally, it is expected that this ethnobotany study can provide a database for further scientific research. The community's knowledge as a legacy will not be repeated if it is not inherited. Besides, this biodiversity is very important as a socio-economic and ecological asset in South Bangka Regency which must be protected by all means from over exploitation.

Key words: early childhood diseases; ethnobotanical; medicinal plant; South Bangka Regency

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INTRODUCTION

Indonesia is one of the centers of biological distribution of medicinal plant in the world and ranked second as the highest wealth after Brazil. Among 40,000 species of flora in the world, 30,000 species are found in Indonesia and 940 of them are known to be efficacious as drugs that have been used in traditional medicine for generations by various ethnic groups (Elfahmi et al., 2014). Medicinal plants are plant species that are trusted and known by the public to have medicinal properties and are used as ingredients for traditional medicine (Jamshidi-Kia et al., 2018). Inheritance regarding knowledge of medicinal plants and the presence of modern medicine are currently developing drastically (Malini et al., 2017).

Ethnobotany is a multidisciplinary field of study; it investigates the cultural context of plant use and botanists' understanding of the ecological and biological traits of useful plants (Tondo et al., 2015). Medicinal plants are traditionally used to treat various types of early childhood diseases. Early childhood (2–7 years old) is an important period of development

that sees large gains in cognitive, motor, and sensory function, as well as improvements in behavior, all of which lay the foundation for the future life (Long et al., 2017). If the child gets sick, parents will immediately treat it in various ways. One of the treatments chosen by parents to treat illnesses experienced by their children is by using traditional medicine (Nursivah, 2013).

The use of plants as medicine by rural communities is due to the increased awareness for healthy living and the increasing overall costs such as consulting doctors, medicine, and medical nurses. Over the past 10 years, medicinal plants have become a topic of public interest, even people who initially used synthetic medicines have begun to switch to using traditional medicines derived from plants (Iskandar, 2012). Factors that encourage the use of traditional medicines are health services in Indonesia that have not been able to reach all the community members (Setyawati, 2009).

South Bangka Regency is located in the southern part of Bangka Island which is included in the Bang-

ka Belitung Islands Province. The people of Bangka still have high belief in treatment to treat various diseases. Traditional use of plants by the people of Bangka Island is one of the knowledge that has been developed and passed down from generation to generation by the ancestors (Ristoja, 2013). The people of the South Bangka Regency have mortality rates for mothers after giving birth reaching up to 20% and infant deaths aged 0-5 years reaching 32% mortality due to the presence of health service factors in Southern Bangka which has not been possible to reach all the community members.

A study on traditional medicinal plants for early childhood diseases has been carried out at Pongok Island, South Bangka Regency. Study on traditional medicinal plants for early childhood diseases obtained 72 types of medicinal plants consisting of 46 families. The most widely used plants include barley stone (Coix lacryma-jobi L), rice (Oryza sativa L), and black sticky rice (Oryza glutinosa Lour) (Hafizoh, 2016). The knowledge of the community in the South Bangka Regency regarding medicinal plants for early childhood diseases was still very limited when compared to other diseases. The use of medicinal plants for childhood diseases has been recognized as a common practice among different people groups in South Bangka Regency. Therefore, research must be applied in everyday life. A study needs to be done since the utilization of plants as traditional medicines for the health of children in the South Bangka Regency has never been reported before. It is expected that this research will contribute to saving public knowledge about medicinal plants as traditional medicine childhood diseases. Besides, it could also inform the public to preserve and develop the potential of medicinal plant species in a sustainable manner.

METHODS

This research was conducted in South Bangka Regency which is geographically located at 22°6'27" - 3°55'56" N and 107°14'31" - 105°5'09" E. South Bangka Regency consists of 8 districts namely: Toboali District, Air Gegas District, Tukak Sadai District, Lepar Pongok District, Pongok Islands District, Pulau Besar District, Payung District, and Simpang Rimba District. The study was conducted in 7 districts of the 8 existing districts leaving Pongok Islands District because there had been previous studies in the area. In general, the dominating tribe in South Bangka Regency is Malay tribe of Bangka.

The age ranges of the interviewed population used in this study refers to Witjoro et al. (2016) namely:

- 17-30 years old are categorized as a young age.
- > 30-45 years old are categorized as adults.

- > 45-59 years old are categorized as middle age.
- > 60 years old are categorized as elderly.

Interviews and general conversations were used to obtain data from traditional healer and other local people. Their knowledge of plants used in the treatment was assessed using a standardized semi-structured adapted questionnaire from previous studies (Olorunnisola et al., 2013). The study was conducted for four months from July to October 2019.

The number of informants was taken by village, where the informants chosen were elders or traditional healers who have knowledge about medicinal plants and treatment systems in each of these villages to represent demographic variables (gender and age group). Interviews were conducted to obtain data similar to those obtained by Apal et al. (2018), i.e. the names of medicinal plants used, types of use or diseases treated, parts of plants used, and how they are processed as medicinal ingredients. Identification of medicinal plant species was done by matching the plants with Herbarium of Bangka Belitungense collections. Data obtained from interviews and observations were processed and analyzed using a quantitative ethnomedicinal statistical index as follows:

Use Value (UV)

Use Value (UV) is to compute the relative importance of a plant based on the number of plants use and the number of people who say it useful (Kayani et al., 2015).

$$UV = ((Ui) / N)$$

Note:

Ui: Number of species used by each informant

N: Total number of informants in the study.

Fidelity Level (FL)

FL is a data to determine which species are most widely used for the treatment of certain diseases by using the following formula.

$$FL = (NP / Nur) \times 100$$

Note:

NP: Number of informants who mentioned the species in the use of certain plants and for certain diseases.

Nur: Total number of usage reports for each category of disease type.

Relative Frequency Citation (RFC)

RFC is used to determine which plants are used most often and which plants are preferred (Kayani et al., 2015).

$$RFC = FC / N$$

Note:

FC: Number of informants stating the use of species

N: Total number of informants in the study

RESULTS AND DISCUSSION

Based on the results of interviews with traditional healers and local people in the South Bangka Regency with 45 informants (Table 1), 7 men (16%) and 38 women (84%) use medicinal plants in childhood disease. The socio-demographic profile of traditional healers and local people that use medicinal plants for childhood diseases consists of four age groups: 17-30 years, 30–45 years, 45–59 years, and >60 years accounting for 2, 13, 19 and 19 people, respectively. The most represented age group was that of patients aged 45-59 years with 42% of the total.

For the educational level, 40% of traditional healers and local people that use medicinal plants for childhood diseases attended at least junior high school. The rest were either not attending school (2%), primary school (31%), and senior high school (27%), and university level (0%). Category use of the time of medicinal plants for childhood diseases and the highest average is that for <2 years (38%), 5-10 years (31%), 2-5 years (24%), >20 years (4%) and 10-20 years (2%) have been doing the treatment that is applied to everyday life.

Table 1. Socio-demographic characteristics that use medicinal plants for childhood diseases

Variable	Category	\sum Informant	Percentage (%)
Informant actorogy	Traditional healer	14	31
Informant category	Local community	31	69
Gender	Male	7	16
Gender	Female	38	84
	17-30 years	2	4
Age	> 30-45 years	13	29
	> 45-59 years	19	42
	> 60 years	11	24
	No school	1	2
	Primary school	14	31
Level of education	Junior high school	18	40
	Senior high school	12	27
	College/University	0	0
	< 2 years	17	38
Time of use	2-5 years	11	24
	5-10 years	14	31
	10-20 years	1	2
	> 20 years	2	4

Furthermore, Table 1 shows there are 45 informants consisting of 2 categories i.e., 14 traditional healers (31%) and 31 local people (69%). One aspect of influencing the treatment of traditional medicine is slightly, compared to the general public, due to the development of more modern times and supported by advancing technological advancements. This is influenced by an instant lifestyle that can make the community's interest in learning traditional medical knowledge diminish. Thus, it is feared that the culture of society about traditional medical knowledge passed down will be lost with the development of more modern times. In addition, it can cause the loss of traditional knowledge possessed by the community, with references to the types of medicinal plants and their benefits. Thus, it is expected that traditional medical knowledge can be known by generation to encourage for research so that traditional medicine can be developed for public health in the future.

The respondents consisted of 38 (84%) females and 7 (16%) males (Table 1). This relates to the dominant early childhood because the relationship between sex and the use of plants as medicine can be seen from the interaction between the community in managing or cultivating medicinal plants. In this case, they often interact with neighbors to exchange information about plants. Howard (2003) stated that the level of knowledge in women tends to be higher than men because women have a higher intensity to interact with plants and they are responsible as housewives. Therefore, women know more plants than men.

Most respondents were aged 45-49 years (19 people) with a percentage of 42%, while the lowest percentage of respondents' age (4%) was 17-30 years with only 2 people (Table 1). According to Yatias (2015), the medicinal plant users were mostly in the age range of 39-48 years with a percentage of 20%, while the smallest plant users were <19 years. It is

influenced by the level of ethnobotany knowledge of people between older age and the younger ones. In this case, older respondents often use medicinal plants because they already believe and are accustomed to using them, whereas the younger generation generally only believes and uses medicinal plants after proving the benefits of medicinal plants and after knowing the properties of the plants used. According to Oran & Al-Eisawi (2015), certain age domination was most likely due to the factor that they were considered to have good knowledge in using medicinal plants in traditional medicine.

The results of the interviews show that the educational background category was mostly junior high schools (18 people) with a percentage of 40%, while the lowest one was elementary school (1 person) by 2% (Table 1). The belief of the people of South Bangka Regency in traditional medicine is a hereditary belief. There is a link between the knowledge possessed by respondents not graduating from elementary school and the lack of knowledge they have about the use of medicinal plants. The utilization of the knowledge they obtain about the use of plants comes from parents or hereditary and exchange of ideas. The level of local knowledge is influenced by age, sex, education, and the level of the community's economy (Reyes-García et al., 2009).

The category of experience in using medication by the people of South Bangka is at most 5-10 years found in 14 people (31%), while the lowest using medicinal plants by the South Bangka community is 10-20 years found in 1 person (2%). The people of South Bangka who use a lot for a maximum of 5-10 years are because they are still young, so there is a little experience in using traditional plants. The experience in using medicinal plants is often found in people aged 35 to 86 years with 21 to 29 years of experience (Panmei et al., 2016).

Based on the results (Table 2) of the analysis on the use of plants as medicine for treating early

childhood disease in South Bangka Regency, there are 55 species of medicinal plants consisting of 35 families. The most widely used medicinal plants are from Euphorbiaceae family with a total number of 5 plant species.

The Euphorbiaceae family is a type of shrub that has scented flowers and leaves. Plants of this family are widely used by the people of Bangka because they are believed to have efficacy as a medicine to cure various illnesses in children and even adults. Cassava plants are included in the family Euphorbiaceae which has excellent benefits for the body's health to treat blood pressure because they have a high enough amount of calcium and play an important role in the formation of body cells and can regulate the blood pressure. The plants of the Euphorbiaceae family are the easiest to find and are often used for cooking ingredients and as wound medicine. The Euphorbiaceae family is easy to cultivate so that many communities in the South Bangka Regency cultivate the Euphorbiaceae family in the garden and even in the public housing parks.

The most widely used plants are onion (Allium cepa), garlic (Allium sativum), turmeric (Curcuma domestica), betle (Piper betle) (Table 2). Shallot plants are used by people to treat stomach aches, colds, fevers, ulcers, asthma, and convulsions. Kuswardhani (2016) stated that onion alone or in combination with other ingredients is quite effective in preventing or treating various diseases such as nosebleeds, flatulence, colds, insect stings, stomach aches, and asthma. According to Swastika (2014), diseases that have been successfully treated with onions such as the skin of onion tubers can be used as a digestive disorder drug by means of onion tubers and the skin is boiled, after being cooked the skin is removed, pounded until smooth. Shallot bulbs can be used as a cold remedy by means of peeled, washed and shredded, then rubbed on stomach, back, and feet 1-2x a day.

Table 2. Ethnobotany index of types of plants as traditional medicine in early childhood diseases

Family	Scientific name	Local name	Life form	Diseases treated	UV	FL	RFC
Acanthaceae	Avicennia marina (Forssk.) Vierh.	Api-api	Tree	Fever	0.02	2.22	0.0005
	Sericocalyx crispus (L.) Bremek.	Pecah beleng	Bush	Hemorrhoid	0.07	6.67	0.001
Arecaceae	Cocos nucifera L.	Kelapa	Tree	Flatulence, sore throat	0.29	28.89	0.006
	Metroxylon sagu Rottb.	Rumbia	Tree	Bloody stools, diarrhea	0.13	13.33	0.003
Blechnaceae	Stenochlaena palustris (Burn. f) Bedd	Ideng-ideng	Bush	Sprue	0.24	24.44	0.005
Bromeliaceae	Ananas comosus (L.) Merr.	Nanas	Herb	Sprue	0.02	2.22	0.0005
Caesalpiniaceae	Cassia alata L.	Ketepeng chino	Shrubs	Deworming	0.02	2.22	0.0005
Caricaceae	Carica papaya L.	Kates	Tree	Stomach ache	0.02	2.22	0.0005
Clusiaceae	Garcinia mangostana L.	Manggis	Tree	Thrush	0.04	4.44	0.001
Convolvulaceae	Ipomea batatas L.	Bijur	Herb	Breath	0.02	2.22	0.0005

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Family	Scientific name	Local name	Life form	Diseases treated	UV	FL	RFC
Cucurbitaceae	Momordica charantia L.	Pare	Bush	Swelling	0.07	6.67	0.001
Euphorbiaceae	Glochidion ferdinandi var. Pubens	Ambong darat	Tree	Urinary pain	0.04	4.44	0.001
	Ricinus communis Linn.	Jarak	Bush	Shortness of breath	0.09	8.89	0.002
	Jatropha curcas L.	Jarak putih	Bush	Shortness of breath	0.04	4.44	0.001
	Macaranga pruinosa Muell. Arg.	Mengkerang	Tree	Convulsion	0.02	2.22	0.0005
	Manihot utilissima Pohl.	Ubi singkong	Bush	Flatulence	0.04	4.44	0.001
Fabaceae	Tamarindus indica L.	Asam jawe	Tree	Sore throat, fever	0.16	15.56	0.003
	Erythrina variegata L.	Dadap	Shrubs	Smallpox, fever	0.07	6.67	0.001
	Uncaria gambir Roxb.	Gambir	Liana	Ear infections, colds	0.13	13.33	0.003
	Psophocarpus tetragonolobus (L.) DC	Kacang botor	Bush	Fever	0.02	2.22	0.000
Lamiaceae	Plectranthus scutellarioides L.	Ati-ati	Herb	Convulsion	0.04	4.44	0.001
	Orthosiphon aristatus (Blume) Miq.	Kumis kuceng	Herb	Hemorrhoid	0.20	20	0.004
Liliaceae	Allium cepa L.	Bawang mirah	Herb	Stomach ache, boils	0.67	66.67	0.015
	Allium sativum L.	Bawang puteh	Herb	Flatulence, boils	0.42	42.22	0.009
Loranthaceae	Loranthus sp.	Benalu	Shrubs	Shingles	0.02	2.22	0.000
Malvaceae	Hibiscus rosa-sinensis L.	Kembang hepatu	Bush	Fever	0.13	13.33	0.003
	Sida rhombifolia L.	Penyapucin	Bush	Boils	0.02	2,22	0.000
	Areca catechu L.	Pinang	Tree	Ear infections	0.02	2.22	0.000
Melastomataceae	Melastoma malabathricum L.	Keramunting	Shrubs	Tonsillitis, wound	0.18	17.78	0.004
Menispermaceae	Tinospora sinensis (Lour.) Merr.	Brotowali	Shrubs	Boils	0.02	2.22	0.000
Mimosaceae	Mimosa pudica L.	Putri malu	Herb	Fever, urinary pain	0.38	37.78	0.008
Moraceae	Artocarpus heterophyllus Lamk.	Nangkak	Tree	Colds, diarrhea, fever	0.09	8.89	0.002
Moringaceae	Melastoma malabathricum L.	Kelatak	Shrubs	Wound	0.04	4.44	0.001
	Moringa pterygosperma Gaertn.	Kelor	Shrubs	Stomach ache	0.04	4.44	0.001
Myristicaceae	Myristica fragrans Houtt.	Pala	Tree	Sprue	0.07	6.67	0.001
Myrtaceae	Psidium guajava L.	Jambu bigik	Tree	Stomach ache, diarrhea	0.40	40	0.009
Oxalidaceae	Averrhoa bilimbi L.	Belimbung wuluh	Tree	Coughs	0.09	8.89	0.002
Pandanaceae	Pandanus furcatus Roxb.	Jelutuk	Herb	Itchy	0.07	6.67	0.001
Piperaceae	Piper ningrum L.	Sahang	Shrubs	Catch a cold	0.24	24.44	0.005
,	Piper betle L.	Sireh	Liana	Ear infections	0.40	40	0.009
Poaceae	Imperata cylindrica Raeusch.	Lalang	Bush	Heartburn, tonsillitis	0.11	11.11	0.002
Touceae	Oryza glutinosa Lour.	Pulut itam	Bush	Tonsillitis	0.02	2.22	0.000
	Oryza sativa L.	Padi	Herb	Boils, smallpox	0.02	6.67	0.000
	Cymbopogon citratus (DC) Stapf.	Serai	Shrubs	Diarrhea, cough	0.07	17.78	0.001
Puniceae	Punica granatum L.	Delima	Shrubs	Stomach ache, diarrhea	0.18	8.89	0.004
	•			Flatulence, thrush, fever			0.002
Rubiaceae	Morinda citrifolia L.	Mengkudu	Shrubs		0.18	17.78	
Rutaceae Solanaceae	Citrus aurantifolia (Christm.) swingle Physalis angulata L.	Jeruk nipis Celepuk	Shrubs Bush	Cough, boils Fever, smallpox	0.27	26.67 11.11	0.006
Sterculiaceae	Sterculia foetida Linn.	Itap-itap	Tree	Convulsion	0.04	4.44	0.001
Styracaceae	Styrax benzoin Dryand.	Kemenyan	Tree	Fever, tonsillitis	0.11	11.11	0.002
Thymelaeaceae	Phaleria macrocarpa (Scheff.)	Mahkota dewa	Bush	Fever, boils, smallpox	0.29	28.89	0.002
Verbenaceae	Boerl. Vitex pinnata L.	Leben	Tree	Eye pain, stomach	0.04	4.44	0.001
Zingiberaceae	Zingiber officinale Rosc.	Jaik	Herb	Catch a cold, asthma	0.36	35.56	0.008
Zingioeraceae	Kaempferia galanga L.	Kencor	Herb	Tonsillitis, flatulence	0.29	28.89	0.006
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Garlic (*Allium sativum*) with UV (0.42), FL (42.22) and RFC (0.009) are used by people to treat flatulence, fever, stomachache, colds, and ulcers. Betle plants (*Piper betle*) with UV (0.33), FL (33.33), and RFC (0.007) are used by the community to treat body odor, eye irritation, to cleanse the body, and as a pain relief. This plant is widely used by the community because pepper plants can be planted at home and these plants have liana growth habit. Pepper plants can be used as a medicine for red eyes, by cutting the stem until the water comes out and then dropping it on the affected eye.

Turmeric (*Curcuma longa*) with UV (0.47), FL (46.67), and RFC (0.010) are used by people to treat diarrhea, boils, and fever. Turmeric root is used for abdominal pain by boiling then drinking it regularly until the pain is reduced. Mukherjee and Wahile (2006) stated that plants that have high RFC values must be preserved or protected to avoid the extinction of the species due to overuse. Plants with high RFC values can also be used for pharmaceuticals and phytochemicals to identify extinct species (Vitalini et al., 2013). The value of UV, and FL influences among traditional medicinal plant users to use medicinal plants to treat diseases. High UV and RFC values are influenced by good healing potential for certain diseases (Asiimwe et al., 2013).

Plant Parts that are used as medicine.

Based on the interviews, the parts of medicinal plants used by traditional healer are leaves, flowers, roots, fruits, seeds, bark, rhizome, and root tubers (Figure 1).

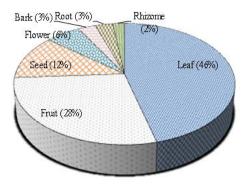


Figure 1. Plant parts used as traditional medicine for early childhood.

Plant parts used to treat early childhood diseases are leaves, flowers, roots, fruits, seeds, bark, rhizome, and root tubers. Leaves are a part that is very easy to find and always available, and its collection and use are relatively easy and simple. In addition, it is another possibility because the properties of the leaves are known from generation to generation more in terms of healing than other parts. The content of substances in the leaves is beneficial for health and has elements

that can cure disease. The results of photosynthesis in leaves produce complex compounds called secondary metabolites (Tsauri, 2011). This compound is generally found in all parts of the plant, especially in the leaves. Secondary metabolite compounds include alkaloids, flavonoids, polyphenols, saponins, and terpenoids. This chemical compound has medicinal properties to treat various diseases. Leaves have a high regeneration to sprout again and do not have a major effect on the growth of a plant even though the leaves are a site for photosynthesis (Meliki et al., 2013).

According to Silalahi et al. (2018), alkaloid compounds are able to detoxify and can neutralize toxins in the body. These types of alkaloids can treat gastrointestinal cancer, breast cancer, and cervical cancer (Kooti et al., 2017). Flavonoids function to expedite blood circulation throughout the body to prevent the occurrence of blockages in blood vessels and reduce the risk of coronary heart disease (Rees et al., 2018). Polyphenol compounds as anti-allergens that function as a source of anti-bacterial and anti-virus, enhance the immune system, increase vitality, reduce sugar levels, and reduce blood clotting (Tsao, 2010). Terpenoids are plant components that can be isolated from vegetable matter by distillation and called essential oil. Essential oils are volatile substances that are useful as stimulants for the body (Mohandas & Kumaraswamy, 2018).

According to the people of South Bangka Regency, a way of processing by pounding is more effectively because the substances which are considered to be able to treat early childhood illnesses and postbirth are not damaged. The boiling process is very easy and economical since it can be boiled repeatedly. Thus, boiling process is popular method among the people. People use medicinal plants with boiling process because repeated boiling of ingredients has no effect even though the properties will be slightly reduced. Simple medicinal plant processing is related to community knowledge about medicinal plants that are generally obtained from generation to generation and based on their daily habits and experiences. Drugs used in traditional medicine do not cause side effects because they can still be digested by the body. The side effects of using traditional medicine are relatively small if it is used appropriately (Nursiyah, 2013). Finally, it is expected that this ethnobotany study can provide a database for further scientific research. The community's knowledge as a legacy will not be repeated if it is not inherited. In addition, this biodiversity is a very important as a socioeconomic and ecological asset in South Bangka Regency which must be protected by all means from overexploitation.

CONCLUSION

This study reports 55 medicinal plant species from 35 families commonly used by local people in South Bangka Regency to treat childhood diseases. The plant of *Allium cepa* L., *Allium sativum* L., *Curcuma longa*, and *Piper betle* L. were among the most cited medicinal plants traditionally used as childhood diseases. The growth habit of the most widely used medicinal plant is tree. The most widely used part of a medicinal plant is the leaf. Therefore, this documented information on the medicinal plants as childhood diseases used in South Bangka Regency may be adopted as baseline data for future pharmacological and phytochemical studies.

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REFERENCES

- Apal, F. U., Ariyanti, N. S. R. I., & Walujo, E. K. O. B. (2018). Medicinal Plant Utilization by the Togutil Tribe in the Buffer Zone of Aketajawe Lolobata National Park. *Jurnal Sumberdaya HAYATI*, 4(1), 21–27.
- Asiimwe, S., Kamatenesi-Mugisha, M., Namutebi, A., Borg-Karlsson, A. K., & Musiimenta, P. (2013). Ethnobotanical study of nutri-medicinal plants used for the management of HIV/AIDS opportunistic ailments among the local communities of western Uganda. *Journal of Ethnopharmacology*, *150*(2), 639–648.
- Bibi, T., Ahmad, M., Bakhsh Tareen, R., Mohammad Tareen, N., Jabeen, R., Rehman, S. U., Yaseen, G. (2014). Ethnobotany of medicinal plants in district Mastung of Balochistan province-Pakistan. *Journal of Ethnopharmacology*, 157, 79–89.
- Hafizoh. (2016). Pemanfaatan Tumbuhan Obat Tradisional untuk Kesehatan Anak Dini di Pulau Pongok. Universitas Bangka Belitung.
- Howard, P. (2003). The major importance of minor resources: Women and plant biodiversity. *IIED Gatekeeper Series, Sussex, UK: IIED*. Retrieved from http://www.farmingsolutions.org/pdfdb/GK112.pdf

- Iskandar, J. (2012). *Ethnobiology and Sustainable Development*. AIPI Bandung: Puslitbang KPK LPPM Unpad.
- Jamshidi-Kia, F., Lorigooini, Z., & Amini-Khoei, H. (2018). Medicinal plants: Past history and future perspective. *Journal of HerbMed Pharmacology*, 7(1), 1–7.
- Kayani, S., Ahmad, M., Sultana, S., Khan Shinwari, Z., Zafar, M., Yaseen, G., ... Bibi, T. (2015). Ethnobotany of medicinal plants among the communities of Alpine and Sub-alpine regions of Pakistan. *Journal of Ethnopharmacology*, 164, 186– 202.
- Kuswardhani, D. S. (2016). *Sehat Tanpa Obat Dengan Bawang Merah Bawang Putih*. Yogyakarta: Andi Offset.
- Long, X., Benischek, A., Dewey, D., & Lebel, C. (2017). Age-related functional brain changes in young children. *Neuroimage*, *155*, 322–330.
- Malini, D. M., Madihah, Kusmoro, J., Kamilawati, F., & Iskandar, J. (2017). Ethnobotanical Study of Medicinal Plants in Karangwangi, District of Cianjur, West Java. *Biosaintifika: Journal of Biology & Biology Education Journal of Biology & Biology Education*, 9(2), 345–356.
- Meliki, Linda, R., & Lovandi, I. (2013). Etnobotani tumbuhan obat oleh suku dayak iban desa tanjung sari kecamatan ketungau tengah. *Protobiont*, 2(3), 129–135.
- Mohandas, G. G., & Kumaraswamy, M. (2018). Antioxidant activities of terpenoids from *Thuidium tamariscellum* (c. Muell.) bosch. And sande-lac. A moss. *Pharmacognosy Journal*, *10*(4), 645–649.
- Mukherjee, P. K., & Wahile, A. (2006). Integrated approaches towards drug development from Ayurveda and other Indian system of medicines. *Journal of Ethnopharmacology*, 103(1), 25–35.
- Neuman, W. L. (2007). Basics of Social Research Methods: Qualitative and Quantitative Approaches. 2nd Edition. Boston: Allyn and Bacon.
- Nursiyah. (2013). Studi Deskriptif Tanaman Obat Tradisional yang digunakan Orang Tua untuk Kesehatan Anak Dini di Gugus Melati Kecamatan Kalikaja Kabupaten Wonosobo. Universitas Negeri Semarang.
- Olorunnisola, O. S., Adetutu, A., Balogun, E. A., & Afolayan, A. J. (2013). Ethnobotanical survey of medicinal plants used in the treatment of malarial in Ogbomoso, Southwest Nigeria. *Journal of Ethnopharmacology*, *150*(1), 71–78.
- Oran, S. A., & Al-Eisawi, D. M. (2015). Ethnobotanical survey of the medicinal plants in the central mountains (North-South) in Jordan. *Journal of Biodiversity and Environmental Sciences (JBES)*, 6(3), 381–400.

- Panmei, R., Gajurel, P. ., & Singh, B. (2016). Ethnobotany and Nutritional Values of some Selected Wild Edible Plants Used by Rongmei Tribe of Manipur, Northeast India. *International Journal of Applied Biology and Pharmaceutical Technology*, 7(4), 1–9.
- Reyes-García, V., Broesch, J., Carvet-Mir, L., & Fuentes-Peláez, N. (2009). Cultural transmission of ethnobotanical knowledge and skills: an empirical analysis from an Amerindian society. *Evolution and Human Behavior*, 30(4), 274–285.
- Ristoja. (2013). *Tumbuhan Obat Suku Lom: Seri Tumbuhan Obat Bangka Belitung*. Pangkalpinang: UBB Press.
- Ristoja. (2017). Eksplorasi Pengetahuan Lokal Etnomedisin dan Tumbuhan Obat Berbasis Komunitas di Indonesia. Jakarta: Balai Besar Litbang Tanaman Obat dan Obat Tradisional.
- Setyawati, T. (2009). Kajian Etnobotani di beberapa Kawasan Hutan Cagar Alam, Jawa Timur. *Jurnal Tumbuhan Obat Indonesia*, 2(2), 114–123. Retrieved from
- Silalahi, V. A., Fachriyah, E., & Wibawa, P. J. (2018). Isolation of Alkaloid Compounds from Ethanol Extract of Rimpang Galang Merah (*Alpinia purpurata* (Vielli) K. Schum) and nanoparticle production from its Alkaloid Extract. Comparative Study of Antibacterial Properties on *Staphylococcus aureus* and *Escherichia coli*. *Jurnal Kimia Sains dan Aplikasi*, 21(1), 1.

- Swastika, A. (2014). *Khasiat Buah dan Sayur*. Yogyakarta: Shira Media.
- Tondo, J. E., Silverio, A. D. P., Bawer, M. C., & Evangelista, L. (2015). Ethnobotany of Lubuagan: Household materials and Ornaments. *Pacific Science Review B: Humanities and Social Sciences*, 1(2), 104–107.
- Tsao, R. (2010). Chemistry and biochemistry of dietary polyphenols. *Nutrients*, 2(12), 1231–1246.
- Tsauri, M. (2011). Studi Etnobotani Tumbuhan yang Berpotensi sebagai Obat Penyakit Pada Anak di Kecamatan Guluk-Guluk Kabupaten Sumenep Madura. Universitas Islam Negeri (UIN) Maulana Malik Ibrahim Malang.
- Vitalini, S., Iriti, M., Puricelli, C., Ciuchi, D., Segale, A., & Fico, G. (2013). Traditional knowledge on medicinal and food plants used in Val San Giacomo (Sondrio, Italy) An alpine ethnobotanical study. *Journal of Ethnopharmacology*, 145(2), 517–529.
- Witjoro, A., Sulisetijono, & Setiowati, F. K. (2016). Pemanfaatan Tanaman Obat di Desa Kayukebek, Kecamatan Tutur, Kabupaten Pasuruan. *Natural B*, *3*(4), 303–310.
- Yatias, E. A. (2015). Etnobotani Tumbuhan Obat di Desa Neglasari Kecamatan Nyalindung Kabupaten Sukabumi Provinsi Jawa Barat. Universitas Islam Negeri Syarif Hidayatullah.