

An Introduction to the Local Plants as Source of Essential Oils for The Sepang Village Community, Mempawah Regency, West Kalimantan

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Abstract

Essential oils are chemical components obtained from plants, are volatile, and give off a distinctive aroma. Essential oils are various products from the perfume industry, soaps, medicines, and cleaning products. Various types of plants produce essential oils. Sepang Village, Mempawah sub-district, West Kalimantan, is one of the villages with the potential for essential oil-producing plants. This community service activity aims to explore the types of essential oil-producing plants planted by the people of Sepang village and increase public knowledge about essential oils and their use. Service activities are carried out through two stages: exploration of essential oil-producing plants and conveying this information to the village community. Based on the exploration results, it was found that the community planted 16 species of plants producing essential oils for cooking spices and medicinal plants. The Sepang village community was very enthusiastic about receiving information, and their knowledge about essential plants and their utilization increased through this activity.

Keywords: Essential oils, plants, spice, medicinal plants, Sepang village

INTRODUCTION

West Kalimantan is one of the provinces on the island of Borneo, famous for its rich biodiversity, including plants. These plants are used for personal or family interests and as a source of income. Some forms of utilization of these plants include as a food ingredient (Nurhajjah *et al.*, 2017) as a medicinal ingredient in traditional medicine (Yusro *et al.*, 2020), (Mariani *et al.*, 2016) and as a producer of essential oils (Hidayanti *et al.*, 2020); (Udawaty *et al.*, 2019); (Aran *et al.*, 2021).

Essential oils are a group of volatile compounds owned by plants with an aroma and used in the perfume, cosmetic, pharmaceutical, and other industries (Andila *et al.*, 2020). Essential oils are one of non- timber forest products with high value (Mariani *et al.*, 2019). Plants containing essential oils have the potential to become a source of income for the community because they have high economic value (Tanasale, 2012), especially for people who live in rural areas.

The Sepang village is in the administrative area of Mempawah Regency. Most of the people of this village work as farmers. People in this village plants various types of plants in the field, garden, and yard, including plants that are a source of essential oils.

This community service activity aims to explore plants in Sepang Village, Mempawah Regency which can produce essential oils and deliver the information to the community of Sepang village. Through the activity knowledge of people of Sepang village regarding essential oil plant sources has the potential to be developed and become an additional source of income for the village community.

METHOD

Community service activities are carried out in two phases. The first phase is to explore the plants around the area where the people of Sepang Village, Mempawah Regency, live. The next phase is to introduce the types of essential oil-producing plants found in Sepang Village and convey their potential as essential oil producers and the various products that can be produced from them.

Before we delivered the information, we measured the knowledge of the community of Sepang village regarding essential oils. We also asked for their knowledge of essential oil

sources. Furthermore, we introduce the plants that produce essential oils we found during exploration. After we delivered the information, we measured community knowledge of essential oil-producing plants. The measurements were to determine the magnitude of the increase in public knowledge of essential oils and the plants they produce after community service activities have been carried out. These activities conducted in February 2022 until August 2022. The Community service activities phases completely describe in flowchart below:

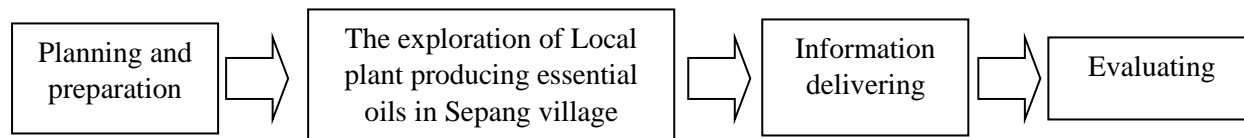


Figure 1. Community Service Activities

RESULTS

The first stage, namely the exploration of essential oil-producing plants, was carried out to obtain information on the types of plants that exist around the residential area of the Sepang village community and potentially as a source of essential oils. The exploration results obtained several types of plants found around community settlements and several types that had been cultivated. The types of plants are listed in Table 1.

Table 1. Essential oils-Producing Plants in Sepang Village

No	Vernacular Name	Scientific Name	Local Usage	Plant Part Used	Plant Location
1	Bangle	<i>Zingiber montanum</i> Roxb	Medicinal plants	Rhizome	Yard, farm
2	Cabe Rawit	<i>Capsicum frutescens</i> L.	Spice, vegetable, medicinal plant	Fruit	Yard, farm
3	Jahe	<i>Zingiber officinale</i> Roscoe	Spice, medicinal plants	Rhizome	Yard, farm
4	Jeruk Purut	<i>Citrus hystrix</i> DC	Spice, medicinal plants	Leaves, fruits	Home yard
5	Kacang Ma	<i>Artemisia vulgaris</i>	Medicinal plants	All parts	Yard, farm
6	Kenanga	<i>Cananga odorata</i> Hook.f	Decorative plants	Flower	Home yard
7	Kunyit	<i>Curcuma longa</i> Linn.	Spice, medicinal plants	Rhizome	Yard, farm
8	Lengkuas	<i>Alpinia galanga</i> L.	Spice, medicinal plants	Rhizome	Yard, farm
9	Limau	<i>Citrus amblycarpa</i>	Spice, medicinal plants	Leaves, fruits	Yard, farm
10	Nilam	<i>Pogostemon cablin</i> Benth.	Decorative plants	Leaves	Home yard
11	Mawar	<i>Rosa sp</i>	Decorative plants	Flower	Home yard
12	Melati	<i>Jasminum sambac</i> Linn.	Decorative plants	Flower	Home yard
13	Sahang	<i>Piper nigrum</i> L.	Spice, medicinal plants	Seeds	Farm
14	Salam	<i>Syzygium polyanthum</i> (Wight) Walpers.	Spice, medicinal plants	Leaves	Yard, farm
15	Serai Wangi	<i>Cymbopogon</i>	Medicinal plants	Leaves	Home yard

No	Vernacular Name	Scientific Name	Local Usage	Plant Part Used	Plant Location
16	Temulawak	<i>nardus</i> (L.) Rendl. <i>Curcuma</i> <i>zanthorrhiza</i> L.	Medicinal plants	Rhizome	Yard, farm



Figure 2. The Community Service Activity

In the first phase, the exploration result, we obtained 16 types of essential oil-producing plants that grow around community settlements in Sepang Village. Furthermore, we conveyed this information to the Sepang village community. We also conveyed the benefit of each plant and the method to obtain or extract the essential oils.

In the second stage, we introduced the potential of essential oils from all plants found around Sepang village community settlements. This event was attended by the people of Sepang Village, who generally work as farmers. We measured the participant's knowledge regarding the essential oil-producing plants twice, before and after we delivered the information. The measurement results are presented in Table 2.



Figure 3. Essential oils-Producing Plants in Sepang Village (A) Temulawak (*C. zanthorrhiza* L) (B) Bangle (*Z. montanum* Roxb)

Table 2. The Measurements Result of Participants Knowledge on The Essential Oil-Producing Plants

No	Questions	1 st Measurement (%)		2 nd Measurement (%)	
		Know	Do Not Know	Know	Do Not Know
1	General knowledge on essential oils	15	85	85	15
2	Knowledge on the benefit of essential oils	60	40	100	0

3	Knowledge on essential oil sources	27	75	90	10
4	Knowledge on essential oil-producing plants	40	60	90	10
5	Knowledge on essential oil extraction methods	10	90	5	95

DISCUSSION

Plants consist of many constituents' chemical components, including extractive or secondary metabolite compounds, which have many benefits, including as a producer of essential oils. The essential oils can be separated from these plants through distillation (Kusbiantoro and Purwaningrum, 2018). Indonesia's known for its mega biodiversity, including various plants as essential oil-producing plants. It supports the potential use of plants as a source of essential oils, which are then developed for economic value. Indonesia, China, and the USA compete globally in the essential oil market (Rosiana *et al.*, 2019). Essential oils have many benefits, and many industries have developed them as additional ingredients or even the main ingredients in the manufacture of perfumes, cosmetics, medicines, food and beverages, soaps, and detergents (Sharmeen *et al.*, 2021).

Sepang village, Mempawah Regency, has great potential in producing essential oils. Based on the results of the exploration carried out in the early stages of our community service activities, it was found that the community accidentally planted 16 types of essential oil-producing plants. These plants are planted around the house or yard and garden as multifunctional, such as kitchen spices, decorative plants, and family medicinal plants (Table 1). According to (Kementrian Perdagangan Republik Indonesia, 2011), in Indonesia there are 39 types of essential oil-producing plants have been cultivated and processed into essential oils. These essential oils are then traded in the global market. All types of plants found in the exploration in Sepang village are included in the plant list.

In Sepang village, being a farmer is the most important occupation of the community of this village. They planted various plants for community needs. The farmers utilize their farm, garden, and home yard to plant. We found some plants that could produce essential oils among those various plants. Chilli pepper or cabe rawit (*C. frutescens* L.) is a plant cultivated by the people of Sepang village, and it can produce essential oil. Despite being used as a vegetable, and cooking spices, this plant is also used as a medicinal plant because it contains many secondary metabolite compounds that support its biological activity as an antioxidant and antidiabetic (Don *et al.*, 2019). Turmeric (*C. longa* Linn), galangal (*A. galanga* L), ginger (*Z. officinale* Roscoe), temulawak (*C. zanthorrhiza* L.) and bangle (*Z. montanum* Roxb) are plants that can easily be found in settlements in Sepang village. The rhizomes of plants from the Zingiberaceae family can produce essential oils (Batubara and Suparto, 2021), including those plants. The villagers of Sepang village use turmeric, galangal, and ginger not only as cooking spices but also as medicinal plants (Pagea *et al.*, 2022).

Kaffir lime and lime are members of the Rutaceae family, known as essential oil producers (Simanjuntak *et al.*, 2021). Kaffir lime and lime, widely used as cooking spices and traditional medicinal plants, are potential sources of essential oils. Many parts of this plant, including leaves, stem, and fruit, can be extracted into oil (Aran *et al.*, 2021). Essential oils from citrus plants have been used in the cosmetic, pharmaceutical, perfumery, and cleaning industries (Agarwal *et al.*, 2022). Patchouli, jasmine, and roses are flowering plants grown by the community to decorate their homes and yards. This ornamental plant has been known for a long time as a producer of essential oils, especially for use as a raw material for making perfume and soap. Even now, it has penetrated the air freshener and clothing fragrance industry (Agarwal *et al.*, 2022).

Lemon grass produces essential oils called citronella oil that have long been used in traditional medicine. Essential oil from citronella contains citronellal, citronellol, limonene, geraniol, and α -pinene, which can be used as an antifungal, antibacterial, and insect-repellent

(Agustina and Jamilah, 2021). It's distinctive aroma and biological activities show that this essential oil is widely used in the pesticide industry, home cleaners, and mosquito repellents (Udawaty *et al.*, 2019). People in Sepang village planted bay leaves for cooking spices and medicinal plants. In addition, bay leaves also have excellent properties in health, cosmetics, perfumes, and aromatherapy. The chemical constituents contained in bay leaves are saponins, triterpenoids, flavonoids, polyphenols, alkaloids, tannins, and essential oils, which consist of sesquiterpenes, lactones, and phenolics (Alhasny and Supriadi, 2021).

In general, the plants we found in Sepang village are planted by the community as cooking spices and ingredients in traditional medicine. People in Sepang village do not know that these plants can produce essential oils with many benefits. Through this community service activity, the community's knowledge of Sepang village regarding the types of essential oil-producing plants that can be developed locally, their distillation methods, and the potential products that can be produced can increase. We can see the increase in community knowledge from measuring community knowledge before and after this community service activity.

CONCLUSIONS And RECOMMENDATIONS

The community service activities increase the knowledge of the community of Sepang village on essential oils. Through this event, the community knows the essential oils-producing plants that can be found in their settlement, the potency of these plants, the method to produce essential oils, and the various products produced from essential oils. We hope the people of Sepang village will develop the essential oils-producing plant hence can increase their income.

ACKNOWLEDGMENTS

We gratefully thank the funding that the Faculty of Forestry of Tanjungpura University gave for this community service activity through DIPA funding year 2022. We acknowledge the Head of Sepang village of Mempawah district and their community for their support and participation, and the Faculty of Forestry of Tanjungpura University students who help this activity.

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