



Dissemination and Development of Original Cajuput Oil

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ABSTRACT: *If we like to use Cajuput oil after bathing, for aromatherapy, for health, and freshness, can we guess where the plant comes from? It turns out that this Cajuput comes from Indonesia. The Cajuput plant belongs to the guava (Myrtaceae), genus Melaleuca. The native Indonesian Cajuput plant can produce oil through the processing process of leaf extracts and plant branches. The results of this preparation can be used for various needs, including: treating headaches, colds, toothaches, diluting chest mucus, and various other health benefits. Its distinctive aroma gives a unique impression of freshness. The use of Cajuput oil can also be combined with other products, such as antiseptic lotions to treat rheumatism. Apart from that, this oil can also be used without adding any other products. Although Cajuput has been widely used by the community, especially for health therapy, the use of this oil can still be improved. Now the plant has been developed by expanding the planting area as well as applying modern technology to obtain better quality.*

KEYWORDS: *Cajuput, Indonesia, dissemination, research and development.*

Received 25 Dec., 2024; Revised 28 Dec., 2024; Accepted 31 Dec., 2024 © The author(s) 2024.

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I. INTRODUCTION

Cajuput oil produced from Cajuput plants (*Melaleuca cajuputi* subsp. *cajuputi* plant or *Melaleuca Leucadendron* [1]) has been cultivated. Various methods have been applied to develop this plant to obtain better quality. Likewise, various factors that can affect the quality of Cajuput plants have been studied, such as genetic quality factors that greatly affect the production of secondary metabolites, the type and age of the leaves, environmental factors, and its composition content, for example, 1,8-cineole in *Melaleuca alternifolia* and *Eucalyptus camaldulensis* [2]. Variations in quantity and chemical composition are controlled by genetic factors and are passed down in the offspring. This is the foundation of the plant breeding program to increase the production of Cajuput oil.

The quality of Cajuput oil is also determined by the type and age of the leaves in which the concentration of oil decreases as the leaves age [3]. The oil content in adult leaves is lower compared to younger leaves [4]. Environmental factors, such as rainfall, climate at the planting site, temperature, sun exposure, humidity, and water stress tend to reduce plant oil production, in addition to chemical, physical and microbiological properties of the soil. The composition of Cajuput oil varies greatly depending on environmental factors, such as rainfall and the soil used for planting.

The aim of this research is to disseminate the developments and efforts that have been made to improve the quality of Cajuput oil by involving modern technology. The first step that must be taken to disseminate the use of eucalyptus oil to the public is to carry out awareness-raising activities to the public about the benefits and content of the Cajuput plant.

Cajuput oil has decongestant properties that can help relieve shortness of breath. So when we inhale the fresh aroma of this oil, the mucus blocking the chest will melt and breathing will feel relieved. In general, Cajuput oil can help relieve pain, in addition, this oil can function as an antibacterial, antiviral, antifungal, antineuralgic to provide protection for the nervous system, antiseptic, prevent infected wounds, improve the performance of the body, antispasmodic, relieve stomach aches, bloating and nausea, colds, reduce cramps, help expel gas in the intestines, help remove excessive sweating, relieve fever by compressing water that has been dripped with oil to provide a cool skin effect [5]. Cajuput can be used to kill unwanted insects, lighten excess oil

in the skin, anti-inflammatory and antioxidant protection from free radicals. Cajuput is also often used for various types of products, such as perfumes, lotions, deodorants and soaps. Cajuput for aromatherapy has antimicrobial properties and has a warm sensation, calming effect and provides sensation to reduce dizziness, improve concentration, relieve fatigue and expel anxiety.

II. LITERATURE REVIEW AND RESEARCH DEVELOPMENT

Kayu putih which has usually been used by the Indonesian people for a long time, comes from the *Melaleuca cajuputi* plant [6]. The oil is extracted, distilled by steam, especially from the leaves and twigs of Cajuput plants. The name Cajuput oil comes from the white color of the tree trunk. In different places, the name of Cajuput oil also has different names. In Malay, Cajuput is known as galam, while for some Ternate people, Cajuput is called bajule. For people in the Maluku and Ambon islands, Cajuput oil has various names such as elan, kilam and ilan [7]. In the Seram islands, Cajuput oil is known as sakelan [7].

It is true that this Cajuput plant often grows flourishing in Eastern Indonesia, but there are also those that grow around northern Australia [8]. However, Cajuput also be tried to grow in other areas with the dry season. Despite its many advantages, Cajuput oil also has disadvantages, one of which is that it is volatile [9]. Cajuput oil is an essential oil obtained by distilling the leaves and twigs of the Cajuput plant (*Melaleuca leucade*) with steam.

Although it has a myriad of benefits, such as relaxing muscles, relieving joint pain and headaches, making the respiratory tract feel more relieved, to things like preventing mosquito bites, we must remain vigilant against excessive use. To anticipate this, we can check the packaging listed on the Cajuput oil bottle, it must be ensured that the oil has not expired, use enough but also not too little so that the benefits of this oil can still be felt. For those who have allergies to certain drugs, it is advisable to consult a doctor first so that it is safe to use and can still get its benefits. Cajuput oil should not be applied directly to open skin wounds so that it does not immediately feel painful. It is better to apply a little and slowly first and if the skin experiences irritation, itching and redness, the use should be stopped. Because of its strong aroma, for asthma sufferers, the use of Cajuput oil may require some caution. It must be ensured that the use of this oil does not worsen respiratory conditions. In addition, it is also necessary to pay attention to use in children and pregnant women.

Cajuput oil contains a variety of ingredients, including linalool, 1,8-cineole, terpineol which can provide a warming sensation when applied to the skin. The quality of Cajuput oil is determined by the high or low levels of cineole. Its quality will increase with increasing levels of cineole. Cajuput oil from the distillation of leaves and twigs of this plant has a fairly pungent aroma, however, if applied to the surface of the skin it usually still safe. Other ingredients contained in Cajuput oil, one of which is eucalyptol [10].

III. METHODOLOGY

Cajuput has long been cultivated in Indonesia, but the efforts are still far from being sufficient. National production that should be able to meet domestic needs is still far from expectations. With good plant breeding techniques, it is hoped that plants with high oil yields can be produced, thereby increasing Cajuput productivity. In addition, good cultivation and distillation techniques will greatly assist in achieving national production [11]. To improve the genetic quality of Cajuput plants, a research institute has been established in Indonesia that specifically researches and handles Cajuput plants. Oil yield is one of the focuses of Cajuput oil plant breeding. This trait tends to be more influenced by genetic factors when compared to environmental factors and is inherited to its offspring [12]. Having superior seeds [13,14] combined with good land quality can increase productivity. The National Research and Innovation Agency, Indonesia also participates in collaborating in an effort to develop research on Cajuput plants to be of higher quality for Indonesia's local plant-based industries. In an effort to increase the productivity and quality of native Indonesian Cajuput plants, plantation with superior Cajuput seeds were built in various locations. In addition, what also needs to be the focus of attention is the technology used to obtain added value by increasing the level of certain content in the Cajuput plant.

IV. RESULTS AND DISCUSSION

The breeding of Cajuput plants is expected to accelerate the acquisition of superior Cajuput seeds, which is carried out by testing on the quality of Cajuput oil. By comparing ordinary Cajuput oil with Cajuput oil from distillation, it shows that the product from distillation is much better. Distillation can be done in several

ways, [15] including: water distillation, water and steam distillation, direct steam distillation. The distillation system by water is considered to be less effective in obtaining the expected quality of Cajuput oil, although it can still be applied if desired. Usually this process is appropriate if used for aromatherapy, such as rose water. In this distillation system, direct contact occurs between the extracted leaves and the heated water. After heating, steam will come out and flowed to the condenser. The water and oil that have been mixed earlier then separated using a separator so that it will be separated based on its specific gravity, the heavier one is at the bottom and the oil is at the top. Distillation with a steam where there is no direct contact between the water and the leaves (because it is blocked by a sieve). When the steaming process occurs, water vapor will rise which will push the oil out of the leaves. The difficulty of this system is that it is difficult to control the stability of temperature and water vapor pressure. It is because it depends on the size of the fire. Distillation using this system is often carried out by traditional communities in the Maluku archipelago. Direct steam distillation does not cause direct contact between leaves, water and fire. The trick is to make high-pressure hot steam in a boiler separate from the leaf container. The resulting water vapor is flowed into a container containing leaves through a pipe. So that the pressure of the hot steam can encourage oil production from the leaves. The mixed hot steam between water and oil is flowed using pipes into a condenser or a pending tub and then drained. This method of distillation with water vapor has advantages over steaming and boiling systems, so this system is more widely used by large-scale industries, although there are also those who do it on a small scale.

After going through an effective distillation process with the steam method, we can then check the quality of the Cajuput oil produced. In Indonesia, Cajuput oil for trading has been standardized which must be in accordance with the Indonesian National Standard (SNI). Cajuput oil that has a cineol content greater than 60% can be categorized as super quality, and a cineol content of between 55% to 60% is classified as the main quality category, while Cajuput oil that has a cineol content of 50% or less than 55% is categorized as the first quality [16]. For observation, the color can be seen directly, usually greenish, yellowish or clear with a distinctive aroma immediately smelled. Meanwhile, the purity depends on the specific gravity, namely the comparison between the specific gravity of water and Cajuput oil in the same temperature and volume.

Basically, this activity is to find out the specifications and characterization of high-quality of Cajuput oil. The following is the flow outlined in the chart below (Figure 1).

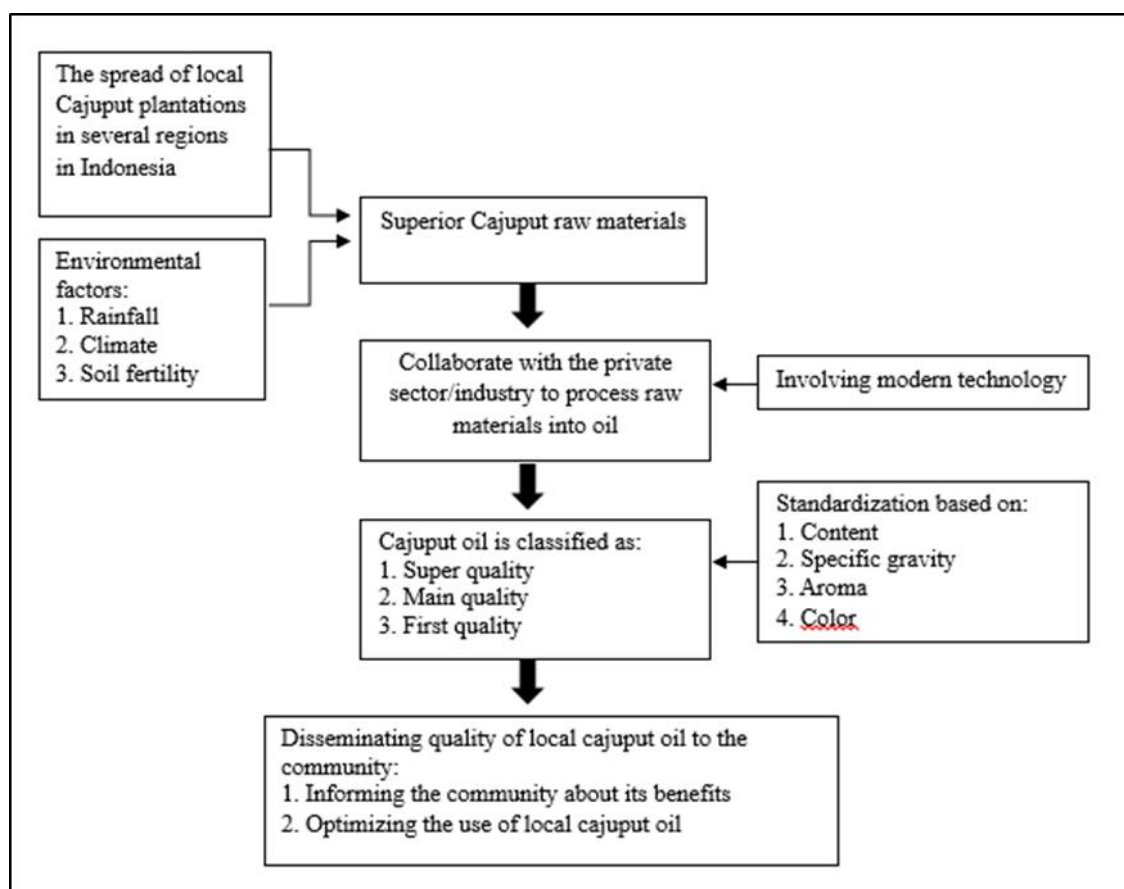


Figure 1. The flow of Dissemination and Development of Original Cajuput Oil

The need for Cajuput oil will continue to increase along with the increasing population. The opportunity to develop the Cajuput oil industry in Indonesia is wide open but the availability of raw materials is still the main factor. Judging from the rainfall and soil fertility levels, several areas in Indonesia that are detected as suitable for planting Cajuput oil are located in the eastern part such as: NTT, NTB, and the Maluku Islands. To cultivate and disseminate local Cajuput plants to the wider community, the availability of superior quality Cajuput is the main requirement. In addition, establishing cooperation with the industry to process Cajuput raw materials with a good refining process must also be met.

V. CONCLUSION

The opportunity to develop local Cajuput oil is actually very promising, but getting good raw materials is not easy. Here are some important points that can be used as a reference in producing and disseminating the development of eucalyptus oil business in the community, First, the availability of superior Cajuput raw materials. Planting eucalyptus trees by considering environmental factors, rainfall, and good soil quality will be able to meet the expected raw material needs. Second, Intensifying efforts to plant good quality local Cajuput. Third, carrying out good cooperation with industry or private parties in developing Cajuput oil business. Fourth, after obtaining quality Cajuput oil, the next step is to disseminate it to the community and inform the benefits of using local Cajuput oil.

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