

Empowering the Community of Mandor Village, Mandor District Landak Regency, West Kalimantan in Utilize the Kaffir Lime Plants as a Potential Source of Essential Oils

Yeni Mariani^{1,2,a)}, Fathul Yusro^{1,2)}, and Hikma Yanti¹⁾

¹Faculty of Forestry of Tanjungpura University, Pontianak, Indonesia

²PUI Herbal Tropis of Tanjungpura University, Pontianak, Indonesia

^{a)}Corresponding Author: yeni.mariani81@gmail.com

Abstract

Essential oil is a type of NTFP with a high economic value produced by plant parts such as leaves, fruit, seeds, flowers, roots, rhizomes, bark, and all parts of the plant. Kaffir lime (*Citrus hystrix*) is one type of essential oil-producing plant that can be cultivated in the surrounding environment (yard, garden) or less productive land so that it has added value. Kaffir lime is a spice or food flavouring with a distinctive aroma and taste due to the presence of citronellal and is used in the perfume and cosmetic industries. This plant can be an opportunity for the community, especially those near the forest, to improve their welfare by cultivating it as a source of essential oils. The purpose of this community service activity is to provide information on the potential of kaffir lime as an essential oil producer to open the insight of the Mandor village community to cultivate kaffir lime plants. The target of this activity is the Mandor village community. We conducted this from May to November 2021, including the preparation and production stages, the essential oil's chemical content and antibacterial analysis, and the delivery of socialization. The empowerment activity was evaluated before and after the action by measuring the knowledge of the village community regarding essential oils and kaffir lime. The results of the action conveyed information on the potential of the kaffir lime plant as a source of essential oil, the process of making essential oil, the results of testing on the content contained in kaffir lime essential oil, antibacterial activity, the form of its use in various products of economic value as well as basic information on the cultivation of this plant.

Key words: Kaffir lime, essential oils, Mandor village, NTFS, empowerment

INTRODUCTION

Forests are known not only as producers of various types of wood that have economic value, but various kinds of other forest products and their derivatives or Non-Timber Forest Products (NTFPs) also have high economic value. When the volume of wood produced from forests has decreased, using NTFPs is one of the right solutions in utilizing forests as a source of income, especially for communities around the forest (Patianingsih and Nizar, 2018). Forests can produce various NTFPs, including rattan, bamboo, agarwood, honey, ornamental plants, medicinal plants, essential oils, and others.

Essential oil is one type of NTFPs that has high economic value. Essential oils or also known as etheric oils, are a large group of vegetable oils in the form of viscous liquids at room temperature but volatile so that they give a distinctive aroma (Kartiko et al., 2021). Essential oils have great potential to be developed and become a source of income, especially for people living around forests. It is supported by the high level of global demand for essential oils. Indonesia, which is rich in natural resources, is one of the largest essential oil-producing countries in the world and ranks 9th. In 2013 the export value of this essential oil commodity reached USD 123 million (Rosiana et al., 2019).

Essential oils are found in plant parts such as leaves, fruit, seeds, flowers, roots, rhizomes, bark, and even all parts of the plant (Anggraini et al., 2019). Currently, it is known that various plants can produce essential oils. Essential oils also can be made from various types of plants, be it woody plants such as eucalyptus, wood lawing, cinnamon, pine, and other types of trees, as well as cultivated plants such as lemongrass. and kaffir lime (Tirta and Wibawa, 2017). This community service aims to deliver information about the potency of kaffir lime as an essential oil

producer to the people of Mandor Village. Encourage the community of Mandor village to cultivate kaffir lime plants.

Kaffir lime (*Citrus hystrix*) is one of the essential oil-producing plants that can be cultivated in the surrounding environment (yards, gardens) or on less productive land so that it has added value. In general, kaffir lime is known as one of the cooking spices. The leaves and fruit of kaffir lime are used as a spice or food flavouring (Astuti et al., 2022). Kaffir lime has various biological activities such as anticancer (Fajarina et al., 2021), antibacterial (Warsito et al., (2018); Jamaluddin et al., (2017); Aran et al., (2021), antidandruff (Tanzil et al, 2017). Based on the enormous biological potential of the kaffir lime plant and its essential oil, the opportunity for its utilization is also significant, mainly to be used as a mixture of various disinfectant products. Therefore, it is very appropriate to cultivate kaffir lime as an essential oil producer to get more benefits from this plant, especially for people living around the forest. Hence, it is important to disseminate information related to the "Utilization of Kaffir Citrus Plants as a Source of Essential Oil" to village communities around the forest.

METHOD

The community service activities are carried out in two stages, namely the manufacture of essential oil from kaffir lime leaves which is carried out at the Laboratory of the Faculty of Mathematics and Natural Sciences, Tanjungpura University. The biological activity assays of kaffir lime essential oils were conducted at the local region of Health Department laboratory of Pontianak. The data obtained was then used for the socialization stage of the people of Mandor Village.

In the empowerment activity, brief lectures were held regarding the potential of kaffir lime plants as a source of essential oils, the process of making essential oils, the results of testing on the content of kaffir lime essential oil, its biological activity (antibacterial activity), forms of utilization of essential oils in various products of economic value as well as basic information related to the cultivation of kaffir lime plants as the use of less productive land. After delivering the information, the session continued with discussion among the community service team and the community of Mandor village. In this socialization activity, brochures or leaflets were also given regarding the use of kaffir lime plants as a producer of essential oils.

RESULTS

There are two phases carried out in this socialization. The first was making essential oil from kaffir lime leaves taken from one area in Pontianak city (Fig. 1). We cleaned the leaves from dirt by washing and drying them for a day, then cut them into small pieces with a scissor. Furthermore, we produce the kaffir lime essential oil using the distillation method (Warsito et al., 2018).

During the socialization activities, participants who are farmers in Mandor Village showed high enthusiasm. It can be seen from the questions asked. Whether or not this kaffir lime plant is easy to cultivate and what products can be produced from the essential oil of kaffir lime leaves became the participants' attention. The questions asked were answered by describing and giving examples to participants regarding farmers who have successfully cultivated kaffir lime plants by utilizing the yards and gardens around their homes. Various products can be produced using a mixture of kaffir lime leaf essential oil and can be made with simple technology, namely floor cleaners, and hand sanitizers (Fadila et al., (2020); Aran et al., (2021), which are currently being used as a trend due to the COVID-19 pandemic.

DISCUSSION

Community service is one of the obligations of lecturers in implementing the educational philosophy of higher education. The results of the research that has been carried out are conveyed to the public to increase not only public knowledge but also various aspects of people's lives, including the health and economic conditions of the community (Widiandi and Gartika, 2021).

The activity evaluation results show that the kaffir lime plant has been known for a long time by the people of Mandor Village, but its use is only limited to cooking spices. The Mandor village community only mentions limited kinds of essential oils. It proves that their knowledge about essential oil sources is low. They did not expect that kaffir lime leaves, usually mixed in several dishes, could be extracted and used as essential oils. Thus, it can be used in products such as floor cleaners, mixtures of laundry soap, and hand sanitizer.

Through this community service activity, the people of Mandor village finally know and understand the potential and utilization of kaffir lime plants as a source of essential oils. According to the people of Mandor village, the empowerment activities carried out are considered significant benefits. It can open up their perspective, especially in utilizing less productive agricultural land, yard, and garden for kaffir lime cultivation. The delivery of materials related to the cultivation and processing of kaffir lime leaves essential oil can motivate farmers to cultivate kaffir lime plants to increase family income.

CONCLUSIONS AND RECOMMENDATIONS

From the implementation of community service in Mandor Village, Mandor District, Landak Regency, it can be concluded that farmers in Mandor village know and use the kaffir lime leaves but only for cooking spices. Their knowledge about essential oils is still limited, including the plant's source of essential oils. The materials given in the socialization can open up their perspective, especially in utilizing less productive agricultural land, yard, and garden for kaffir lime cultivation, hopefully enhancing the community motivation to cultivate kaffir lime plants and produce essential oils to increase family income.

ACKNOWLEDGMENTS

We acknowledge the Faculty of Forestry of Tanjungpura University for funding this community service activity. We express gratitude to the Head of Mandor village of Mandor district for their support, the community of Mandor village for their participation in this activity, and the student of the Faculty of Forestry who joined this community service.

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APPENDIX



Figure 1. Kaffir lime leaves



Figure 2. The Community Service activity