Abdimas Umtas: Jurnal Pengabdian Kepada Masyarakat
LPPM-Universitas Muhammadiyah Tasikmalaya
Volume: 6, Issue:4, October, 2023; pp: 4484-4490
E-ISSN: 2614 - 8544

Improving the Quality of Honey and Socialitzion of Flora Nectar Producer as Bee Feed in the Bangunkarya Village Langkaplancar District Pangandaran

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Abstract

Honey production depends on the availability of nectar and pollen as bee food. In Bangunkarya Village, this potential is abundant and has not been utilized optimally, which includes yards, gardens, and forest flora. At least fifteen residents have coffee plantations that have started to bear fruit and harvest; these people's coffee plantations are an essential source of nectar and pollen. Currently, only two residents are active in the honey business. The village in Langkaplancar District is currently active in becoming a Tourism Village in support of the Aspiring Geopark Pangandaran. Increasing the quality and production of honey is targeted in community service activities to contribute to advancing geo products. Activities include identifying nectar and pollen-producing flora, socializing nectar-producing flora, educating about hygienic honey products, and making attractive honey packaging. Two types of honey that have been improved in quality and given names to marketers are the name Hani Kuya, given to natural honey from Apis dorsata bees, and Rosisdin Honey for livestock honey from Teuwul bees (Heterotrigona sp.). Quality improvements include improving packaging, filtering techniques, dosage, and providing product name labels. Honey products that have experienced improvements in quality have been exhibited in Forum Group Discussion (FGD) activities at the Pangandaran Tourism office as a promotional step to encourage increased sales and economic value.

Keywords: Aspiring Geopark, nectar potential, quality, honey production

INTRODUCTION

Bangunkarya Village is in Langkaplancar District, Pangandaran Regency, West Java. This village consists of 4 hamlets: Wangkalronyok, Mekarmulya H, Karangbungur, and Karangmulya Hamlet. Cisangkal Tourism Village is located in Mekarmulya Hamlet, which has various natural riches. Apart from having tourism potential, Bangunkarya Village itself can produce abundant agricultural products so that it has opportunities for agrotourism. Local durian and smallholder coffee plantations are a small part of the business, which is quite promising. In existing conditions, most people earn a living by working as farmers. It cannot be said that they are professional farmers. Most of the population still farms using traditional methods. Yard plants are essential; people grow kitchen spices and vegetables for their families to consume. Around people's houses, it is straightforward to find cassava plants, cayenne peppers, tomatoes, bananas, turmeric, ginger, etc. In line with realizing the aspiring Pangandaran geopark, it is necessary to promote various activities that support this. One of the Cisangakal Tourism Villages in Bangunkarya village is a target for development from various aspects. The community service

https://doi.org/10.35568/abdimas.v6i4.4025

activities we carry out focus on improving the quality of local honey products. This is based on abundant natural potential, including natural forests, people's garden plants, and yard plants. Various types of nectar-producing flowers have not been utilized optimally. In Bangunkarya village, when we started our activities in August 2023, only two people were involved in the honey business. One person collects natural honey, and another breeds stingless bees from a type of Teuwel bee known as *Heterotrigona* sp. Stingless beekeeping has been widely practiced in various regions in Indonesia as an effort to increase people's income (Priyambodo, 2023)

Two people who are active in the honey business both run the honey business in different versions. Mr. X (what I call him) relies on Odeng honey, which is taken from the forest conventionally. This business depends on the natural production of honey availability without any intervention, so it is tough to maintain production continuity. Sometimes, they can only harvest twice or three times with minimal quantities in a month. One-time harvest takes around 2-5 bottles with a syrup bottle size of around 450ml, but this is not precisely known. Meanwhile, Mr Y still breeds Teuweul bees (*Heterotrigona sp*). on a small scale. Each month, he harvests honey in 2 bottles. This condition is still far from sufficient for a business. So, neither Mr. X nor Mr. Y can entirely rely on their income from the honey business.

The service community aims to improve honey quality and socialize Honey developers' potential in Bangunkarya village, Lampaklancar District, Pangandaran. Through this activity, it is hoped that it can increase the income of people who rely on honey production as their business area and open up opportunities for livestock honey businesses to optimize the utilization of the potential nectar resources available in the village. Honey as a healthy food must be encouraged in its production, quality, and sales (Utami et al., 2020).

METHOD

To achieve the service target, it is carried out in stages which include:

- Observation and identification of flora that produces nectar and flora. The method for identifying flora species uses a field guide and compares it with literature. Interview residents complemented this field activity to obtain information on agricultural plants.
- Socialization of the potential of nectar-producing flora, garden plants, yard plants, and forest plants is conducted at the Village Office, attended by the community.
- Review the production process. In this case, observation of the container used for the filtering process and containers for packaging honey sales. Activities are carried out by involving ourselves in the production process.

RESULTS

The result of flora identification

The importance of introducing the benefits of local plants to the community to use them optimally (Fathul et al., 2023). More than 40 species of nectar and pollen-producer flora, but only 13 plants are shown here, species that are often found around yards and gardens (Table 1). Apart from the 13 names of flora, many other floras grow wild around gardens and yards, which can potentially be nectar sources, such as the family Asteraceae and Mimosaceae.

https://doi.org/10.35568/abdimas.v6i4.4025

Volume: 6, Issue:4, October, 2023; pp: 4484-4490
E-ISSN: 2614 - 8544

Table 1. Most commonly found nectar-producing flora

No	*Latin name*	Local name	Explanation
1	*Amomum compactum*	Kapolaga	Yard
2	*Arenga pinnata*	Aren	Forest and garden
3	*Arnacidium occidentale*	Kedondong	Yard
4	*Calliandra callothyrsus)*	Kaliandra	Garden and Yard
5	*Coffea robusta*	Kopi	Garden and Yard
6	*Cocos nucifera*	Kelapa	Garden and Yard
7	*Durio zibethinus*	Durian	Forest and garden
8	*Etlingera elatior*	Honje	Yard
9	*Musa paradisiaca*	Pisang	Garden and Yard
10	*Nephelium lappaceum*	Rambutan	Yard
11	*Etlingera elatior*	Honje	Garden and Yard
12	*Asteraceae Family*	Aster	Garden and Yard
13	*Mimosaceae family*	Polongan	Garden and Yard

Figure 1. Socialization of the potential of nectar and pollen-producing flora as bee food

Socialization of Nectar's and Pollen Potential Flora

The activity began with the seminar for socialization of the potential for honey production carried out in the Bangunkarya village hall. The presentation contains descriptions of nectar-producing flora as food for honey bees, often found around home yards, gardens, and forests. The availability of food sources in the form of nectar and pollen produced by plants greatly influences the breeding and productivity of honey bee colonies (Erwan, 2022). Nectar is a complex compound produced by the glands of necterifier plants in solution form. The main components of nectar are sucrose, fructose, glucose, melibiose, ratinose derivatives, other carbohydrates, organic acids, resins, salts, and minerals. Bees need nectar as a source of

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carbohydrates, sources vitamins, and minerals (Nicolson, 2022). Tropical forests have very high diversity, which belongs to the Bangunkarya village forest. The coffee plantation owned by 15 residents has enormous potential for flora development. According to Supeno et al. (2021), coffee whose pollination process is assisted by *Tetragonula sp*. bees can increase coffee production. Therefore, bee farming in coffee plantations has two essential points: increasing coffee harvest and producing honey with an exotic aroma. The vital point in socialization activities to increase honey production and quality is that people realize the great potential around them. The nectar-producing flora and bees that act as honey producers in Bangunkarya village have not been utilized optimally, which is a big challenge for them.

At the seminar, there was an opportunity to discuss with the audience the continuity of nectar availability. Natural resources in the form of an abundance of flora with various types make it possible for flowering plants to exist throughout the year. The flowering season and its duration are different for each type of plant; for example, papaya (*Carica papaya*) is a type of plant that flowers without a season; once it starts flowering, it will continue to flower until the plant is no longer productive (Zhang et al., 2021). Likewise, Coconut (*Cocos nucifera*), guava (Psidium guava), and oranges (*Citrus nobilis* and some Citrus sp.). *Arenga pinnata* is a type of flowering plant that has the potential to produce nectar and is also food for *Apis mellifera* honey bees (Lima et al., 2019; Abyan et al., 2021; Zarni, 2022; Purnamasari et al., 2022. Nadira et al., 2023); this plant is often found in yards and forests. Asteraceae family flowering plant is a widespread flora found in yards and gardens. It has the potential to produce nectar. The large number of plants around the yard and garden ensures the continuous availability of bee food. The most common coconut found around the house is a type of plant whose nectar is preferred by *Apis cerana* bees (Erwam et al., 2022). The bees at the service location are Nyiruan bees (*Apis cerana*), Odeng bees (*Apis dorsata*), and Teuwel (Heterotrigona sp). The *Apis dorsata* bee is a species that cannot be cultivated (Nila et al., 2022); they live freely in the forest, while *Heterotrigona sp*, the stingless bee, is typical for livestock. The people's coffee plantations in Bangunkarya village provide bee feed. It has not been used for beekeeping as an added value to coffee plantations

Quality Improvement Efforts

The next stage is to pay attention to the production sequence of the natural honey of *Apis dorsata* and the Stingless honey Bee of *Heterotrigona. Sp.* The production process is conventional and simple; the honeycomb containing honey is squeezed by hand and filtered using a coconut milk filter without gloves. The original packaging uses used syrup bottles, filling the bottles without measuring the volume. Based on our observation, the steps taken are as follows:

- Explained that gloves are necessary to keep the honey clean when squeezing honey.
- There is a need to mention precise volume so that consumers know clearly about the product
- They buy. This activity made two packaging with 250 ml and 350 ml volumes.
- Replace used bottles with new ones cleaned first before filling honey.
- Designing honey product label is done through discussions to obtain approval of those who are proucers of natural honey and lovestock honey.

https://doi.org/10.35568/abdimas.v6i4.4025

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Figure 2: a). *Heterotrigona sp.* bee cage, b). Design natural honey products of *Apis dorsata* bees, c). Design for livestock honey of *Heterotrigona sp.* bees

Based on the study of the activities that have been carried out, a diagram of the process of improving honey quality can be created as follows (Fig.3). The honey products resulting from the training were exhibited on August 3 at the Forum Group Discussion and Geotourism Workshop, which took place at the Pangandaran Regency Tourism and Culture Office.

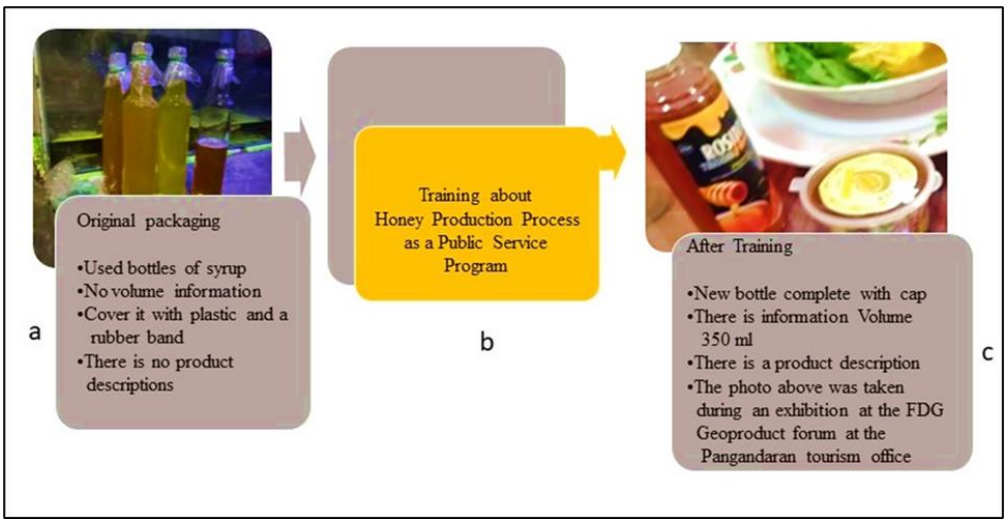

Figure 3. Honey products before and after training in the honey production process

CONCLUSIONS AND RECOMMENDATIONS

The conclusion of Community service activities include:

- Socialization of the potential of nectar-producing flora as bee food, which is an opportunity to increase honey production

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- Education on product hygiene, the need for hygienic bottles for honey packaging
- Improve the cleanliness of the honeycomb pressing process by using a more hygienic filter
- Improve the appearance by diversifying bottle sizes from syrup bottles to 350 and 250 ml. This is to allow buyers to choose according to their needs at a more affordable price, and prepare for tourist visitors to shop for honey that is easy to carry.
- Create labels and trademarks to be easily recognized; eye-catching label designs are prepared with a production number column.

The recommendation is that there will be cooperation between business actors and Village-Owned Enterprises (BUMDES: Badan Usaha Milik Desa) for honey product registration to obtain the legality of the business.

ACKNOWLEDGMENTS

Thank you to the residents of Bangunkarya village, the Directorate of Research and Community Service UNPAD, and the Head of the Pangandaran Tourism and Culture for their assistance and cooperation during the Community Service activities.

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