

January 27-29, 2023

Ankara, Türkiye

**5. INTERNATIONAL ANKARA
MULTIDISCIPLINARY STUDIES
CONGRESS**

FULL TEXTS BOOK



**Edited by
Prof. Dr. Memet ŞAHİN**

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**IDENTIFICATION OF HONEY BEE FEED SOURCES IN THE OMAH TAWON
MATARAM (OTM) CULTIVATION AREA**

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ABSTRACT

The honey bee farming business has a great opportunity to be developed at this time. Cultivation activities can be carried out in yards, gardens, and even in the forest. The main problem in beekeeping is the availability of feed sources. It is important for Omah Tawon Mataram (OTM) as a newly established beekeeper to pay attention to the availability of feed sources at all times. For this reason, in this study, an analysis was carryout of the availability of feed sources at the Omah Tawon Mataram honey bee cultivation site.

The research was carried out at OTM honey beekeeping location in August-November 2021. The research data collected was to identify the types of plants for honey bees feed. Identification of food for honey bees is carried out through direct data collection in the field followed by a literature study. The flowering time of plants was carried out through literature studies and analyzed descriptively.

The results showed that of the 26 species of plants in the location, 17 species became a source of food for honey bees. 1 species from the families Arecaceae, Euphorbiaceae, Meliaceae, Anacardiaceae, Apocynaceae, Lythraceae, and Musaceae; 2 species from Verbenaceae; 3 species from Malvaceae; and 5 species from Fabaceae. Various types of feed sources have different flowering periods that affect the availability of feed sources. Potential sources of food for honey bees in OTM such as bungur, petai, waru, pulai, banana, teak, sengon, durian, rubber tree, sonokeling, jengkol, suren, and mango only flower in certain months. However, there are several food sources available throughout the month, namely laban, coconut, petai china, and cacao. Based on the results of this study, it can be seen that OTM has sufficient potential as a source of feed so it has the potential to be developed as a location for honey bee cultivation.

Keywords: honey bee cultivation, feed sources, plant, flower.

INTRODUCTION

Honey has become a very popular commodity these days. Global honey demand shows a high increase. Based on the estimated use compounded annual growth rate (CAGR), the development of the honey

market will be growing by 5.2% from 2022 to 2030. This honey is produced by various species of honeybees spread across various countries. The types of honey bees that are the mainstay of honey beekeepers are stingless bees. This type of stingless bee usually lives in tropical and subtropical areas such as Africa, Australia, and Central and South America. In addition, one of the countries where the stingless bee is spread is Indonesia (Kwapong et al., 2010).

As one of the tropical regions with high wealth and diversity, Indonesia is one of the honey producers that can enter the international market. However, the amount of honey exported abroad is still small compared to other countries. Even in 2017-2020, there was a successive decline every year. One reason is the demand for honey in the country itself is also very large. Where there has been a doubling of the demand for honey from 2019 to 2020 as shown by the import value of honey in 2019 (3,041.46 tons) and 2020 (6,216.29 tons) (Indonesian Ministry of Agriculture, 2021). The discrepancy between the demand and availability of honey in this country is due to the relatively low production of honey (does not reach 100,000 liters) in 2020 (in 2019 it could reach almost 500,00 liters). One of the reasons for this very significant decrease is the bee farmer's constraints on the source of honey bee feed. Honey beekeeping requires a location that is rich in forage for bees so they don't escape from the beehives. (Fatihurrazakiah et al., 2020; Rizaty, 2021). Based on these problems, honey beekeepers must pay attention to the availability of honey bee feed sources.

One of the honey bee farms that is currently developing is Omah Tawon Mataram (OTM) in Lampung Province, Indonesia. Honey bee cultivation in this group is still relatively new. OTM was established in 2021. Initially, honey bee cultivation was carried out in the yard of the house. However, due to limited space and food sources, OTM moved the honey bee cultivation location to a wider community forest area. This is expected to support the availability of food sources for honey bees. One of the influencing factors to support the development of honey bee cultivation is the availability of bee feed throughout the year. The bee's food needs must be met at all times to maintain the life of the bees. Honey bees get food from the nectar and pollen of various types of trees or surrounding plants (Hermita, 2013).

It is very important to know the existence of feed sources at the cultivation site. For this reason, in this study, data collection was carried out on various types of plants that have the opportunity as a source of food for honey bees. So the purpose of this research is to carry out an inventory of honey bee feed sources in the OTM cultivation area.

METHOD

This research was conducted at the Omah Tawon Mataran (OTM) cultivation area, Mataram Village, Gading Rejo District, Pringsewu Regency, Lampung Province, Indonesia. The cultivation location is on the edge of the Way Sekampung River and borders a protected forest. This research was conducted from July to November 2021. Data collection was carried out through primary and secondary data collection. Primary data collection used a survey method directly to the OTM honey bee cultivation area to directly observe various types of plants in the field. Secondary data collection by conducting literature studies on the types of plants used by honey bees as a source of feed. All data that has been obtained were analyzed descriptively.

FINDINGS AND DISCUSSION

A. Honey Bee Food Source

Cultivation activities can be carried out in yards, gardens, and even in the forest. The main problem in beekeeping is the availability of feed sources. The food source for honey bees is plants which include; fruit plants, vegetable plants, ornamental plants, food plants, plantation crops, and forestry plants. The flowers of these plants contain nectar and pollen (Lamerlabel, 2011). Almost all types of plants that have flowers can be used as a food source for honey bees, but there are flowering plants that produce toxic compounds so that honey bees do not use them as a food source. For this reason, it is necessary to collect inventory data on plants in a cultivation location. In this study, data were obtained on a variety of plants ranging from plantation crop commodities to crops. This is because the location of this cultivation is a community forest area. Field observation results are presented in Table 1.

Table 1. Plant species for honey bee food source

No	Local name	Scientific name	Family
1	Coconut	<i>Cocos nucifera</i>	Arecaceae
2	Bungur	<i>Lagerstroemia speciosa</i>	Lythraceae
3	Waru	<i>Hibiscus tiliaceus</i>	Malvaceae
4	Teak	<i>Tectona grandis</i>	Verbenaceae
5	Pulai	<i>Alstonia scholaris</i>	Apocynaceae
6	Banana	<i>Musa acuminata</i>	Musaceae
7	Sengon	<i>Albizia chinensis</i>	Fabaceae
8	Laban	<i>Vitex pubescens</i>	Verbenaceae
9	Petai	<i>Parkia speciosa</i>	Fabaceae
10	Cacao	<i>Theobroma cacao</i>	Malvaceae
11	Durian	<i>Durio zibethinus</i>	Malvaceae
12	Jengkol	<i>Archidendron pauciflorum</i>	Fabaceae
13	Rubber tree	<i>Hevea brasiliensis</i>	Euphorbiaceae
14	Petai Cina	<i>Leucaena leucocephala</i>	Fabaceae
15	Sonokeling	<i>Dalbergia latifolia</i>	Fabaceae
16	Mango	<i>Mangifera indica</i>	Anacardiaceae
17	Suren	<i>Toona sureni</i>	Meliaceae

The results showed that of the 26 species of plants in the location, 17 species become a source of food for honey bees. 1 species from the families Arecaceae, Euphorbiaceae, Meliaceae, Anacardiaceae, Apocynaceae, Lythraceae, and Musaceae; 2 species from the Verbenaceae family; 3 species from Malvaceae family; and 5 species from Fabaceae family. The characteristics of each plant family can be one of the things that can determine which family members have the potential to support honey bee production (Batoro et al., 2022). The diversity of flower plant from 10 family have potential become honey bee food source such as Fabaceae (*Albizia chinensis*, *Parkia speciosa*, *Archidendron pauciflorum*, *Leucaena leucocephala*, *Dalbergia latifolia*), Malvaceae (*Hibiscus tiliaceus*, *Theobroma cacao*, *Durio zibethinus*), Verbenaceae (*Tectona grandis*, *Vitex pubescens*), Musaceae (*Musa acuminata*), Lythraceae (*Lagerstroemia speciosa*), Apocynaceae (*Alstonia scholaris*), Anacardiaceae (*Mangifera indica*), Meliaceae (*Toona sureni*), Euphorbiaceae (*Hevea brasiliensis*), Arecaceae (*Cocos nucifera*).

These types of plants (Table 1) are around the OTM honey bee cultivation area. It is very important for honey beekeepers to prepare a source of feed around the honey bees being farmed. Bees have limited distance in finding food sources. Most honey bees prefer to forage close to their hives to collect food (Basari et al., 2018). Various types of plants in Table 1 are a source of nectar and pollen for honey bees. This species diversity has advantages for honey beekeepers. This is because honey bees collect nectar and pollen not limited to only one type of plant, but various types of flowering plants (Batoro et al., 2022). Where pollen is the main source of protein, fat, minerals, and vitamins for bees. Nectar is the main source of carbohydrates used by honey bees to get energy (Adekanmbi & Ogundipe, 2009). These two types of feed sources are essential needs that support the health of honey bees (Couvillon et al., 2015).

B. Flowering Period

Honey bees need flowering plants to obtain food sources in the form of pollen or nectar. Each type of plant has a different flowering period. The flowering period of the types of food sources for honey bees at the study site is presented in Table 2.

Tabel 2. Flowering period

No	Local name	Scientific name	Flowering month											
			1	2	3	4	5	6	7	8	9	10	11	12
1	Coconut	<i>Cocos nucifera</i>	v	v	v	v	v	v	v	v	v	v	v	v
2	Bungur	<i>Lagerstroemia speciosa</i>					v	v					v	v
3	Waru	<i>Hibiscus tiliaceus</i>						v	v	v				
4	Teak	<i>Tectona grandis</i>	v	v	v	v	v					v	v	v
5	Pulai	<i>Alstonia scholaris</i>										v	v	v
6	Banana	<i>Musa acuminata</i>												
7	Sengon	<i>Albizia chinensis</i>			v	v	v	v				v	v	v
8	Laban	<i>Vitex pubescens</i>	v	v	v	v	v	v	v	v	v	v	v	v
9	Petai	<i>Parkia speciosa</i>								v	v	v		
10	Cacao	<i>Theobroma cacao</i>	v	v	v	v	v	v	v	v	v	v	v	v
11	Durian	<i>Durio zibethinus</i>						v	v	v	v			
12	Jengkol	<i>Archidendron pauciflorum</i>	v								v	v	v	v
13	Rubber tree	<i>Hevea brasiliensis</i>								v	v	v		
14	Petai Cina	<i>Leucaena leucocephala</i>	v	v	v	v	v	v	v	v	v	v	v	v
15	Sonokeling	<i>Dalbergia latifolia</i>							v	v	v	v	v	
16	Mango	<i>Mangifera indica</i>												
17	Suren	<i>Toona sureni</i>								v	v	v	v	

Potential sources of food for honey bees in OTM such as bungur, petai, waru, pulai, banana, teak, sengon, durian, rubber, sonokeling, jengkol, suren, and mango flower only in certain months. However, there are several food sources available throughout the month, it is laban, coconut, petai cina, and cacao. Various types of feed sources have different flowering periods that affect the availability of feed sources. Unavailability of feed in one period of time can result in the migration of honey bees to other locations in search of food sources (Mooy, 2020). Availability of feed all the time with alternating flowering periods plays a role in the availability of feed sources which also plays an important role in the development of beekeeping and honey production systems (Olana & Demrew, 2019).

The flowering period of plants in the beehive environment can affect the level of honey production. Bees will only fly to find food on the plants around them. Short flowering period can cause decreased honey production. In addition, the scarcity of food sources derived from nectar or pollen can also cause honey bees to move to other places. Therefore, the availability of forage plants with sufficient numbers and continuous flowering time is a very important factor so that honey bee colonies can produce optimally (Erwan et al., 2022). So it is very important in OTM areas to have various types of plants that will have varied flowering seasons to ensure sustainable food availability. Based on the results of this study, it can be seen that OTM has sufficient potential as a source of feed so it has the potential to be developed as a location for honey bee cultivation.

CONCLUSION

OTM has many plant spesies that have potential become honey bee food source. 1 species from the families Arecaceae, Euphorbiaceae, Meliaceae, Anacardiaceae, Apocynaceae, Lythraceae, and Musaceae; 2 species from Verbenaceae family; 3 species from Malvaceae family; and 5 species from Fabaceae family. OTM areas have various types of plants that will have varied flowering seasons that maintain sustainable food availability. Bungur, petai, waru, pulai, banana, teak, sengon, durian, rubber tree, sonokeling, jengkol, suren, and mango only flower in certain months. However, laban, coconut, petai cina, and cacao flower available in every months.

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IV. INTERNATIONAL ANKARA MULTIDISCIPLINARY STUDIES CONGRESS

IV. ULUSLARARASI ANKARA MULTİDİSİPLİNLER ÇALIŞMALAR KONGRESİ

İlgili makama;

5. Uluslararası Ankara Multidisipliner Çalışmalar Kongresi 27-29 Ocak 2023 tarihleri arasında Ankara, Türkiye’de 34 farklı ülkenin akademisyen/araştırmacılarının katılımıyla gerçekleşmiştir. Kongre kapsamında sunumu yapılan 313 bildirinin 146 adeti Türkiye’den katılımcılar tarafından; 167 bildiri ise 34 ülkeden katılımcılar tarafından sunulmuştur. Kongre 16 Ocak 2020 Akademik Teşvik Ödeneği Yönetmeliğine getirilen “*Tebliğlerin sunulduğu yurt içinde veya yurt dışındaki etkinliğin uluslararası olarak nitelendirilebilmesi için Türkiye dışında en az beş farklı ülkeden sözlü tebliğ sunan konuşmacının katılım sağlaması ve tebliğlerin yarısından fazlasının Türkiye dışından katılımcılar tarafından sunulması esastır.*” değişikliğine uygun düzenlenmiştir.

Bilgilerinize arz edilir,

Saygılarımla,

Prof. Dr. Hacer HÜSEYNOVA
Düzenleme Kurulu Üyesi

