Scientific Papers, Series B, Horticulture, Vol. LVI, 2012
ISSN Online 2286-1580, ISSN-L 2285-5653

LOQUAT AS A SOURCE OF NECTAR AND POLLEN IN THE WİNTER FOR BEEKEEPİNG

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Abstract

Honeybees (Apis mellifera) are important pollinators of fruit species, and are considered an indispensable element of agriculture. Loquat (Eriobotrya japonica Lindl.) which blossom in winter and whose bloom period lasts at least 2 months, was evaluated as an important source of pollen nectar in beekeeping. Pollen length is between 1.290-1.799 mm (average 1.517mm) and pollen width is between 0.925-1.267 mm (average 1.116). Loquat flowers contain a large amount of nectar and has a prominent fragrance. Since there are no other flowers in the environment in winter months, bees should benefit from loquat nectar and pollens in this period.

Key words: Loquat, *Eriobotrya japonica*, pollination, pollen, nectar

INTRODUCTION

80% of the flowery plants on the earth is dusted by the insects and 85% of them are on the list of honeybees. A honey potential list has been prepared to detect the honey productivity of honeyed plants. This list is used in most of the countries worldwide. Honey productivity at the lowest capacity is evaluated as first class, and honey capacity at highest level is evaluated as the sixth class (Anonymous, 2010c). When the values such as water, soil, heath that affect the honey productivity are assumed at the highest level, on a land of one hectare (10 000 m^2), it is assumed that there is same honeyed plant as closure and the total nectar productivity of this land is evaluated. According to this evaluation, Loquat is in the group of plants with third class honey potential with 51-100 kg/hectare. However, according to blooming time, loquat takes place in the group of
"The plants that release nectar, sectarianize, pollinate in late autumn and winter" [3].
Loquat is grown as cultivated plan at coastal departments. It is important because, it blossoms in winter, has high pollen productivity and lots of blossoms. The loquat begins to come into flower in the end of October. Blooming can continue in December, January even in February. The flowers are 10-17 cm and like woody panicles. They are yellow and beige. Cultivation area is at the height of 0-400 m and coastline [3].
The most convenient climate for the cultivation of Loquat is hot mild climate where the temperature is not below the freezing point. At -3°C flowers and fruits get harmed. In April and May when the fruits start to mature, the early start of summer heats and rise of the temperature over 30°C cause sunburns on the fruits. Violent wind and pollination affects fertilization negatively and reduce productivity.
Loquat starts to yield fruit 2-3 years after vaccination. At the age of 10-12 they come to the level of economic yield. Their most productive terms are the first 23-25 years. The recommended plantation ranges for Japanese plums are 7x7 and 8x8 meters. The possible cultivation areas and bee colony conditions of these areas are given in the Table 1.

Table 1. The number of bee colony in the areas convenient for the cultivation of Loquat and honey production amount (Resource: http://www.aricilik.gov.tr) .

Regions	Colony Number (number)	Honey Production (Tones)
Black Sea	1.102.813	20.247
Aegean	995.155	9.200
Mediterranean	762.313	13.346
Marmara	460.387	6.639
Southeastern Anatolia	265.127	4.740
Turkey	4.888.961	81.364

Black Sea region plays an important role in Turkey's apiculture. Ordu in Black Sea Region, has the biggest bee colony. In Ordu, the total number of beehives is 323.901, honey production amount is 9.203,19 tones; the total number of beehives of Turkey is 4.888.961 and the honey production amount is 81.364,09 [1].

MATERIALS AND METHODS

The material of the workshop consists of the flowers from a kind of loquat on the 25 January 2010. Pollens have been received from the flowers and illustrated by photomicroscope and their breadths and heights have been measured.

RESULTS AND DISCUSSION

The aim of the fruit cultivation is to achieve abundant and qualified products. An important method for this is the realization of pollination and fertilization in a health way. Honey bees have an important role in the pollination of fruit species (*Apis mellifera* L.). Honey bees should be accepted as an inevitable element of agriculture and used in an effective manner. The Japanese plums (*Eriobotrya japonica* Lindl) that come into flower and the blooming period of which lasts 2 months, are accepted as an important pollen and nectar source for apiculture (Photo 1). It has been seen that in the flowers of Japanese plums have dense nectar and nice scent. It has been notified that in İzmir bees carry white pollens to their beehives in December and the source of the pollens have been loquat trees [1]. The more the bees contribute to the pollination of the product, the more mature and abundant the products are. Furthermore, honey that they produce is more essential than the other products. The contribution of bees to the agriculture economy is approximately 15-20 billion dollars for the USA.

Photo 1. Honeybee picking pollen and nectar from the loquat flowers

Bees perch on approximately 120 thousand flowers to produce 1 gram honey. 450 grams honey is accumulated with 17 thousand bees flying on 120 thousand flowers. A bee contributes to the honey com bone twelfth of a tea spoon during life time. The Anatolian people have a 3 thousand years of apiculture history. When honeybee is aforesaid, firstly honey comes into minds, but honey is not the only duty of honey bees, they also ensure the fertilization and production of the flower from which they pick nectar and pollen.

In the measurements of 10 pollen from the loquat plant trees that are grown in Ordu, it has been observed that: the height of pollen is between 1.299-1.799 mm; the breadth of pollen is between 0.925- 1.267 mm; the

average pollen height is 1.517 mm, pollen breadth 1.116 mm (Photo 2,3). It has been observed that loquat flowers have dense nectar and nice scent. The flowers are yellow and beige. Bees like that scent. A honeybee flies on approximately 1.500 flowers and fill its stomach and honey sac by picking nectar amounting half of its own weight. Female worker bees can fly away as far as 3.5 km from the nest. It means more than a 4.000 hectares field scanning around the colony.

Photo 2. The appearance of anther in the loquat flower.

In one loquat flower, it has been observed that there is 139.105 no/flowers, in one anther there is 6.014 no/anther and 0.0104 mg/anther pollen [6]. Besides nectarous, the amount and quality of the pollen produced are the most important ones. Because, the existence and abundance of the pollen ensure the pollination and pollen at high amounts have important roles such as ensuring pollination and attracting the insects, especially the honey bees. Honey bees contribute to pollination and on the other hand, they benefit form the pollen of the plants as a food source and they prefer high quality and abundant pollen for the land choice [5]. The main factor that reveals the nutritional value of the plants in terms of apiculture, nectar and pollen quality of the plants (Photo 4) that the honey bees benefit as a food source and the determination of these materials as weight per flower. Today, there are lots of methods to determine the amount of pollen of the plants [8-4-7]. It has been determined that in Japanese plum, pollen amount for per flower is 0. 2413 mg, for per anther is 0.0104 [7].

Photo 3. Breadth view of anther in the loquat flower.

While honey bees meet their pollen and nectar needs from the plants around, they also contribute to the growth of the plants, development of agricultural products, and the efficiency of feed crops as much as water and fertilizer. Because, when the loquat is considered, in the trees that aren't fertilized with bees, 4% of flowers fructify; but the flowers that are fertilized with bees fructify at the rate of 83 %. It has been observed that when trefoil, a feed crop is concerned, in the land that isn't fertilized with bees, 1-2 % of the land sets seed; but, in the land that is fertilized with bees this proportion is 53 % [2]). Albert Einstein knew the pollination ability of the bees and to emphasize the importance of bees for the agricultural products, he said that when the bees died the human beings would also die of hunger.

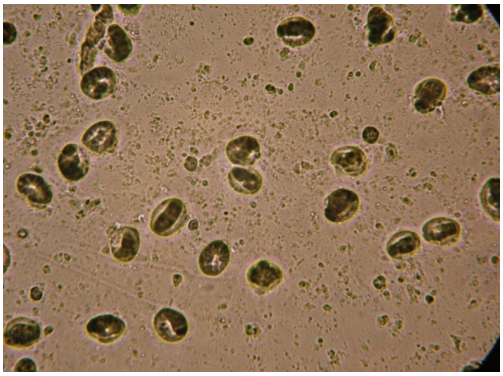

Photo 4. The view of the pollens in the loquat flower

The Loquat is an important fruit species for bees, because they can benefit form it as nectar and pollen source. This plant can be cultivated easily in the coastal strip of Turkey. The beekeepers carry their bees in summer to the Central and East Anatolia region so that they gain pollen and nectar; but they stay in shorelines in winter. It will be an important development in terms of apiculture that the Loquat will be acknowledged as an important plant among the plant species that are established under the name of honey and nectar forests. It goes without saying that most of 120 thousand plants in Turkey is nectar and pollen plant and thanks to this advantage Turkey can fulfill the EU communities' honey gap with honey import at an amount of 225 thousand tones.

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