HONEY PLANTS OF GUZELYURT (MORPHOU) IN NORTH CYPRUS

Çağın Korkmazer[1], F. Neriman Özhatay[1]*

[1] Eastern Mediterranean University, Faculty of Pharmacy, Famagusta, and TR North Cyprus, via Mersin 10 Turkey.

*Corresponding author: neriman.ozhatay@emu.edu.tr , +903926302401

ABSTRACT

This study was aimed to determine melliferous / honey plants visited by honey bees in Güzelyurt (Morphou). Melliferous plants or honey plants bear any substance that is collected by bees to produce honey. Honey has been used frequently, especially in traditional medicine, because it is easily obtained, cheap, safe and has no side effects. The properties of honey are different due to floral sources. The study area is located in North Cyprus, which is one of the richest floristic area in the region. The major objectives of this project are to identify the plant sources used for the production of local honey in Güzelyurt (Morphou) North Cyprus.

According to the results, 40wild species, including an endemic species, Onopordum cyprium (Photo 1.and 11) and cultivated plant species of the flowering plants were determined.

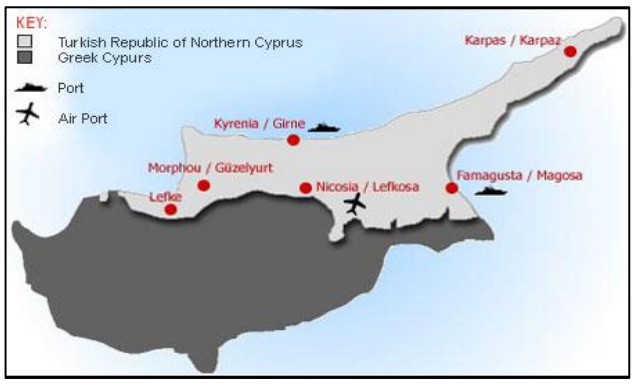
Key words: Honey plants, Güzelyurt (Morphou), North Cyprus.

Figure 1: *Onopordum cyprium* an endemic species to Cyprus (photo taken by Sami Tompson).

INTRODUCTION

Honey is the most frequently used bee product and it is stored in honey stomach of bees when they harvest nectar. The nectar contain enzymes which breakdown the larger sugar, sucrose, in the nectar into glucose and fructose. Its colour varies in different regions due to the variety of plant species. The known effects of honey in human body is as follows: Antibacterial, antimicrobial, anti-inflammatory, antiparasitic, anti-oxidant effects, shortening the duration of diarrhoea and even complimenting chemotherapy or representing a satisfactory alternative or complimentary means of chemoprophylaxis or chemotherapy. Raw states of honey include; 20% water, 2 predominant natural sugars, 11 enzymes, 14 minerals, 21 amino acids and vitamins A, B- mentinodomplex, C, O, E, and K, beta-carotene, minerals, and enzymes. There are various floristic studies carried out in Turkish Republic of North Cyprus (TRNC) (Snogerop, S., Gustafsson, M., Bothner, R.1990., Stephenson, R. 1993). The vascular flora of TRNC according to a number of researchers is about 1257 species; 19 of which are endemic (Meikle, 1977, 1985, Viney 1994, 1996).

In the project, Güzelyurt region was chosen because of its rich flora and honey production. Due to the various species in the flora and richness of the *Citrus* trees in the region Güzelyurt is a an important location for beekeepers. There are 107 beekeepers registered in the area. This number is about 1/2 of the total number of beekeepers in North Cyprus. Most of the colonies in North Cyprus are located in this region. Güzelyurt District is a district of Northern Cyprus. It consists only of the Güzelyurt sub-district. Its population was 30,590 in the 2011 census, but this included Lefka; with its current borders, its population was 18,946, constituting 6.6% of the population of Northern Cyprus. Güzelyurt District was formed on 1 June 1998 via separation from Lefkoşa District. Lefke (Lefka) had been its second sub-district until 27 December 2016 (TRNC Census 2006, District population census 2011, Kıbrıs Postası, 2016).



Map 1: Northern Cyprus with the districts (Settlements of Güzelyurt District – Aydınköy – Akçay - Aşağı Bostancı – Gayretköy – Güneşköy - Güzelyurt İkidere – Kalkanlı – Mevlevi – Şahinler – Serhatköy – Yayla - Yukarı Bostancı – Yuvacık - Zümrütköy)

MATERIALS and METHOD

Field Studies

Field studies took place in two 6-month terms after obtaining the information about the areas where the flowering plants around the hives were collected. During the collection process, in addition to personal observations, some general information was taken: The experience and knowledge of beekeepers, which plants the bees visited, and which plants pollen and nectar are received. Also flower colour, plant general structure and properties of the leaves of plants were recorded for future features that will help in the promotion of both.

Plant specimens were collected around the beehives in Yayla Settlement. A total of 60 plant samples were collected during the field studies conducted between October 2016 and April 2017. Photographs of all collected samples were taken in the natural distribution and the samples were pressed as herbarium specimens for identification. The samples that have been determined scientifically have been placed in the Herbarium of the Faculty of Pharmacy of Eastern Mediterranean University (E.M.U.) that is established for the first time in E.M.U. University, in Magusa of North Cyprus.

Herbarium Studies

Herbarium is a plant museum in which pressed plant-dried specimens are placed in a certain systematic order and scientific studies are carried out with these specimens. Herbarium that serves as a documentation center is a counseling service for scientists who will work in all plant-related areas.

How to prepare a herbarium specimen?

When a plant is collected from the field 10 steps should be applied to the herbarium entrance:

1. Collection of plant specimens.
2. All necessary information (detailed location, habitat, etc.) related to the sample collected is noted in the land register book.
3. The sample is pressed in accordance with the rules for drying. The pressing process is continued until the sample is completely dry, by changing the wetting paper every 2 days.
4. The dried samples are kept at -25 °C in order to remove insects and insect’s eggs at least 2 days.
5. The sample taken from deep freezing is attached to the herbarium sample cartoons in accordance with the rule.
6. The scientific name of the attached sample is determined by the experts. This process is called plant identification.
7. The name of the glued sample is determined.

8.The identified samples are registered in the herbarium registry or database and a herbarium inentory number is given.

9.The labels and cards containing the information entered in the herbarium registry or the database are prepared and the labels are affixed to the cardboard.

10.Prepared specimens are preserved by proper storage.

Herbarium of Eastern Mediterranean
University Faculty of Pharmacy**EMUP**

Nom. : *Malva sylvestris*

Common Name : Ebemgömeci, Gömeç

Fam. : Malvaceae

Loc. : Güzelyurt Yayla

Dat. : 18.03.2017

Alt : 36m

Leg. : Çağın Korkmazer **Det :**N:Özh.&Ç.Kork

Nectar / Polen : ☐☐ **No : 042**

Figure 2: An example of Herbarium label of honey plants

Figure 3: Herbaryum specimen of *Malva sylvestris*

Pollen Studies

Honey specimens were taken from the beekeepers standing in the field. Honey plants of Güzelyurt were determined by the method of the comparison of the pollen of the collected plants with the pollen contained in these honey specimens. Thus, the plant source of honey produced in the borders of studied area has been scientifically revealed.As a result of various microscopic studies, it has been tried to prove that plant pollen is present in honey. After all the collected plants have been dried carefully, herbarium work has been done and all the plants

in the project have been pressed. All these studies have been examined in bee hives in Güzelyurt region. Due to our limited time, we only worked with 45 plant species and 9 tree species collected in the region. We have also reported the bee products obtained from these plants as well as other medicinal uses of plants.

Honey specimens were taken from the bees placed in the field and the detection studies were carried out by comparing the pollens contained in these specimens to those of collected plants. Used materials are as follows: Microscope, aceto-orcein, glycerin gelatin, microscope slide, coverslips, needle, to get pollen, spatula, heater.

Figure 4: Çağın Korkmazer in laboratory studies examining pollen grains

Pollen grains found in flower honey that is light yellow color honey. It is harvested in the spring season.

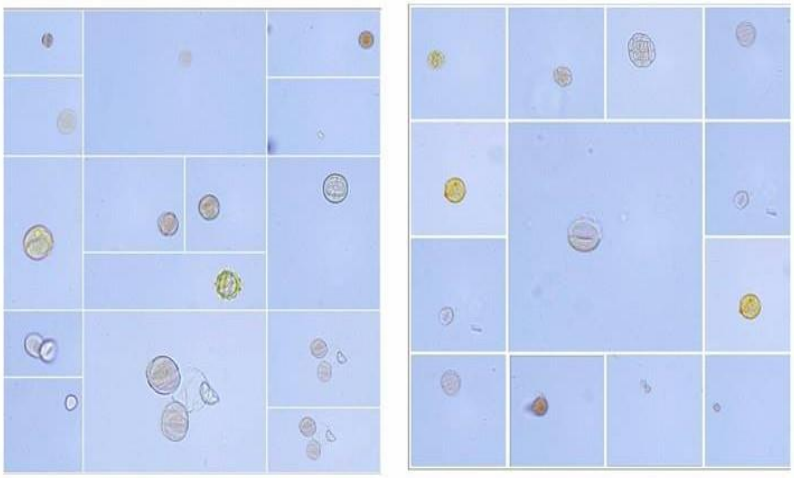


Figure 5: Pollen grain in honey (Güzelyurt region).

RESULTS

As a result of various microscopic studies, it has been tried to prove that pollen is present in honey and identy the spcies or family . After all the collected plants have been dried carefully, herbarium work has been done and all the plants in the project have been prepared as herbarium specimen, identfied mounted and labeled.

Due to the limited time, only spring honey was investigated and 40 wild species were determined. Wild species detected were presesented on the Table 1. The cultivated plants were mainly fruit trees and cultivated vegetables are given as follows:

1 *Schnis molle* **2** *Eucalyptus camaldulensis*

3 *Prunus dulcis* **4** *Prunus persica*

5 *Prunus spinosa* **6** *Citrus limon*

7 *Citrus sinensis* **8** *Lycium ferocissimum*

9 *Phacelia tanacetifolia* **10** *Solanum lycopersicum*

11 *Vicia faba*

Table 1.List of wild honey plants distributed in Güzelyurt (Morphou), TRNC.

Scientific Name	Common Name	Turkish Name
Acacia cyanophylla	Mimosa saligna	Kıbrıs Akasyası
Anthemis palaestina	Chamomile	Papatya
Asphodelus aestivus	Asphodel	Çiriş otu
Calicotome villosa	Hairy thorny broom	Azgan
Cardaria draba	Hoary cress	Kedi otu
Chrysanthemum coronarium	Crown daisy	Papatya
Cistus monspeliensis	Montpellier cistus	Laden Otu
Cistus parviflorus	Rockrose	Küçük Çiçekli Laden
Convolvulus althaeoides	Mallow bindweed	Boru Çiçeği
Ecballium elaterium	Squirting cucumber	Eşek Hıyarı
Echium angustifolium	Hispid viper's-bugloss	Dar Yapraklı Engerekotu
Echium plantagineum	Purple viper's-bugloss	Kuzudili Yapraklı Engerekotu
Erodium malacoides	Mediterranean stork's bill	Dönbaba
Erodium moschatum	Whitestem filaree	İğnelik
Eruca vesicaria	Rocket	Roka
Ferula communis	Giant fennel	Çakşır otu
Gladiolus italicus	Wild gladiolus	Kılıç otu
Heliotropium hirsutissimum	Heliotrope	Aygün çiçeği
Inula conyzae	Ploughmn's spikenard goniza	Gölge Andız otu
Lamium album	White dead nettle	Beyaz Ballıbaba
Malva nicaeensis	French mallow	Gömeç ilmikotu
Malva sylvestris	High mallow	Büyükebegümeci
Medicago murex	Spiny medick	Dişlek Yonca
Mentha longifolia	Mint	Nane
Moraea sisyrinchium	Barbary nut	Yumrulu Süsen
Onopordum cyprium	Cyprian donkey	Thistle Eşek Dikeni
Orchis italica	Naked man orchid	Tavşan Topuğu Orkidesi
Oxalis pes-caprae	Bermuda buttercup	Ekşilice
Papaver dubium	Blindeyes	Gelincik
Polygonum arenarium	European knotweed	Kumsal Çoban Değneği
Prasium majus	White hedge-nettle	Çalıbaba
Raphanus raphanistrum	Wild radish	Yabani Turp
Salvia fruticosa	Greek sage	Adaçayı
Sinapis arvensis	Field mustard	Lapsana Yabani Hardal
Smyrnium olusatrum	Alexanders	Yabani Kereviz
Tamarix tetrandra	Four-stamen tamariks	Ilgın Ağacı
Thymus capitatus	Thyme	Tülümbe
Thymus vulgaris	Common thyme	Kekik
Tragopogon porrifolius	Common salsify	İskorçina
Vicia sativa	Common	Yabani Fiğ

Asphodelus aestivus

Asphodelus aestivus with honey bee

Malva sylvestris with honey bee

Crateagus monogyna with honey bee

Figure 6: Photos of some honey plants determined in the study area.

REFERENCES

Kıbrıs Postası.Lefke 6.ilçe oldu!" 27 December 2016. Retrieved 27 December 2016. Güzelyurt District (Northern Cyprus)

Meikle, R.D. 1977. Flora of Cyprus, Vol. 1, Published by The Bentham,-Moxon Trust Royal Botanic Gardens, Kew.

Meikle, R.D. 1985. Flora of Cyprus, Vol. 2, Published by The Bentham,-Moxon Trust Royal Botanic Gardens, Kew.

Snogerop, S., Gustafsson, M., Bothner, R. 1990. Brassica sect. Brassica (Brassicaceae). I. Taxonomy and Variation, Willdenowia, **19**: 271-365.

Stephenson, R. 1993.The endemic succulents ofCyprus.CactusSuccu. J., **65**: 6, 301-305. TRNC Census 2006 (TRNC State Planning Organization) Retrieved 2011-05-05.

Viney, D.E. 1994, 1996. An Illustrated Flora of North Cyprus, Vol.I-II, Published by Koeltz Scientific Books, Koenigstein, Germany