



## RESEARCH ARTICLE

## Perception Levels of those who make Agriculture in Mesaoria Plain (Cyprus) Regarding the Ecological Position of the Wild Jujube (*Zizyphus Lotus L. (Desf.)* Bush

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ARTICLE INFO	ABSTRACT
Received: Jul 11, 2024 Accepted: Sep 27, 2024	Mesaoria plain farmers have a great role in the future existence of <i>Zizyphus lotus L.</i> While determining the farmers' perception levels towards the protection of this plant species is the main aim of the article, determining the place of <i>Zizyphus lotus (Z. lotus)</i> bushes in the ecology of Cyprus is second aim of the article. The studies carried out in the research area can be grouped under three headings: field studies, literature review studies and application studies. For this purpose, <i>Z. lotus</i> localities in the research area were examined and the relationship between shrubs, farmers of their habitats and geographical variables was tried to be revealed. In the field studies, <i>Z. lotus</i> living areas were first identified and photographed. The questionnaire was generated from the literature review regarding the issue and was administered to the farmers in the form of a mutual interview and the answers were evaluated. The most important information obtained from mutual interviews, 70% of the farmers knew and recognized the <i>Zizyphus</i> shrub and 30% stated and confirmed that they did not know the plant. Of the 30% of participants who did not have information, 85% were immigrants, while the other 15% were local and new generation, all under the age of 30 (Cypriot). In order to protect this plant, in-service training should be given to immigrant farmers who do not know the effectiveness of this shrub. Because they uproot or try to uproot this shrub while ploughing their fields before planting. Another important information from the interviews was that, the reason for the continued existence of the shrubs in Mesarya was that 50% of the farmers stated that they could not be uprooted 30% stated that they were fodder for small cattle (Sheep, goat), and 20% stated that they were consciously protected because they provided shelter for wild animals, especially hunting animals. Most of the participants in the survey (50%) stated that <i>Z. lotus</i> grew by chance and that they were looking for a way to remove them, but that they had a deep root that made it difficult to get rid of them.
<b>Keywords</b> Wild Jujube Perception Ecological Cyprus Zizyphus Lotus L	
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### 1. INTRODUCTION

#### 1.1 Mesaoria plain ecology

##### 1.1.1. Geomorphology

The Mesaoria plain is bounded on the east (Lefke) and west (Famagusta Bay) by the Mediterranean Sea, on the south by the Troodos Mountains and on the north by the Kyrenia Mountains. Mesaoria Plain is 25-30 kilometers wide and 90-95 kilometers long between Kyrenia Mountains and Trodos Mountains. It has an area of approximately 1000 km<sup>2</sup>. It rises to an altitude of 325 m, with an average elevation of perhaps 100 m. There are a number of rivers and other water courses crossing this plain, but none of them have water year round. Between Dilekkaya, Erdemli, Alayköy and Serhatköy, Ercan surroundings are areas where there are beautiful examples of table hills (Kutoğlu, 2010; İlseven 2017).

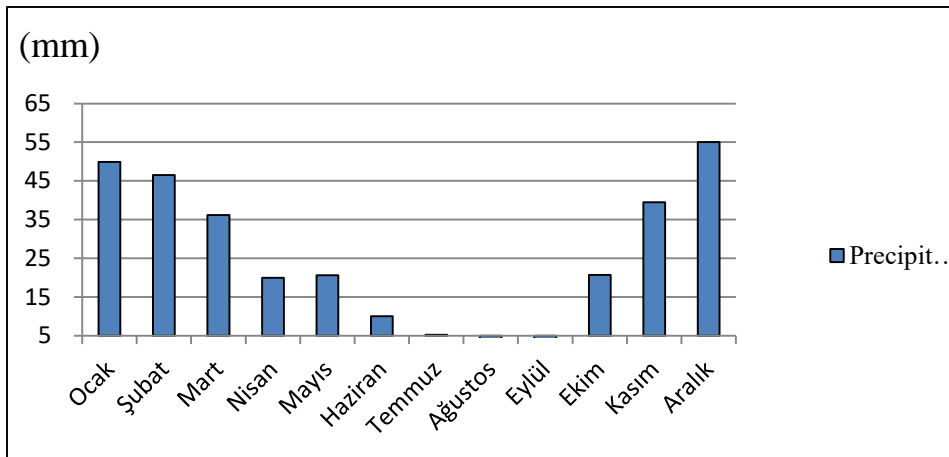


Figure 1: Monthly Precipitation Average of Nicosia (1978-2020)

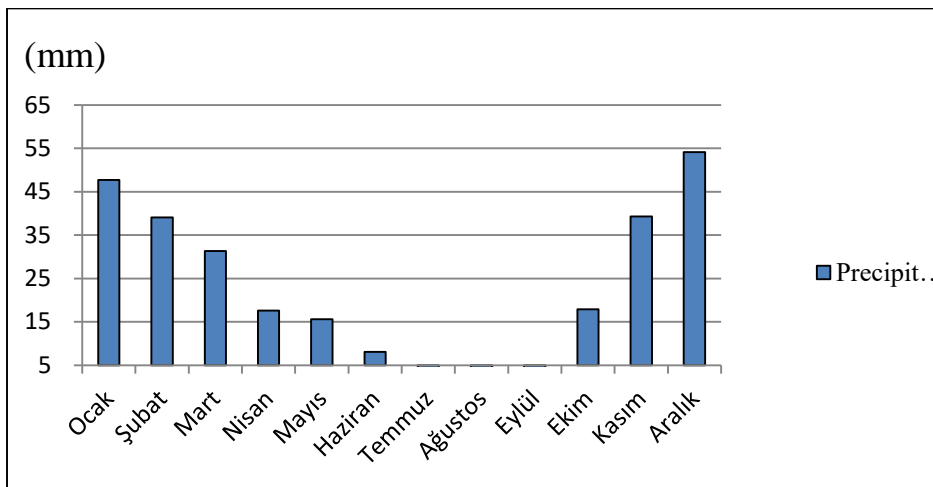


Figure 2: Monthly precipitation Average of Dortyol (1978-2020)

### 1.1.2. Climate

Since Cyprus is located in the Eastern Mediterranean, it receives less rainfall than the Western Mediterranean Countries. The reason for the lack of precipitation is that the Eastern Mediterranean is 5 degrees further south than the Western Mediterranean and is open to deserts and their effects. In addition, the effect of traveling low pressures entering the Mediterranean Basin in the west gradually decreasing towards the east plays an important role in the lack of precipitation.

Mesaoria is an area between Kyrenia Mountains and Trodos mountains where daily and annual temperature differences are high as it is closed to sea effect. With the effect of dry air in Mesaoria, temperatures increase during the day and decrease at night. During the summer season, temperatures exceed 40 C at times during the day, and at night it will be cooler than on the coast. The plain is the area with the least rainfall in Cyprus.

The average annual precipitation in this plain is around 335 mm. The least wetted area is Güzelyurt Plain, which is the continuation of the plain in the west. Gaziveren within this boundary is 272.1 mm, Güzelyurt 285.2 mm, and Zümrütköy 275.7 mm is the places where the island receives the least amount of precipitation with annual average rainfall.

### 1.1.3. Vegetation

With the effect of climatic conditions, steppe plants are dominant in Mesaoria (İçova). Otherwise, the grass formation of the plain is represented by the step (steppe) formation. It is rare to see trees and forests in these areas in terms of geographical conditions. Some of the bulbous and tuberous steppe species that grow on the plain are perennial and await the vegetation period of the following year, while protecting some of their organs (Ilseven, Hıdırer and Tümer, 2014).

Some of them are one year old and grow in January-March and wrap in summer at the end of spring. Although perennial herbs are the main elements of the temperate zone steppe areas, hundreds of grass species belonging to a wide variety of families distributed in this wide ecosystem. The most important of these are; Mallow (*Malva sylvestris*, *Malva cretica*, *Malva aegyptia*), Anemone (*Anemone blanda*), Mustard (*Sinapis arvensis*), Crop Chamomile (*Chrysanthemum segetum*), Yellow Chamomile (*Chrysanthemum coronarium*), Sourish (*Oxalis pes-caprae*), Mandrake (*Mandragora officinalis*), Squill (*Asphodelus aestivus*), (Urginea maritime), Blue star (*Scilla autumnalis*) Umbrellas Saliva Grass (*Ornithogalum umbellatum*), False Leek (*Allium triumumum*, *Allium trifoaf*), (*Bongardia chrysogonum*)

Wild jujube (*Zizihypus lotus*) and chakras (*Prosopis farcta*), Asparagus (*Asparagus acutifolius*), drought-resistant salt-loving, salts inside the stream (*Tamarix tetranda*, *Tamarix smyrnensis*) are the shrubs that spread. There are trees planted in the British colonial years in Mesaoria (İlseven 2014; İlseven, 2020). Eucalyptus (*Eucalyptus camaldulensis*, *Eucalyptus tereticornis*, *Eucalyptus gomphocephala*) brought in during this period for the purpose of drying the marshes and supplying firewood. Especially land roads and iron trees planted along the old railroad iron trees (*Casuarina equisetifolia*) and parkinsonias (*Parkinsonia aculeata*) are the most important of these (İlseven and Baştaş, 2017).

In arid and semi-arid ecosystems like as Cyprus, precipitation and temperature are the main factors that limit productivity and determine the vegetation pattern. Shrubs and trees adapt to their environment with physiological adaptation. Plants regulate their water conditions with osmotic adjustment, stomata aperture, root distribution and leaf canopy properties and adapt to semi-arid and arid climatic conditions (Gorai, Maraghni, and Neffati, 2010; İlseven, 2020).

Wild jujube (*Ziziphus lotus*) is a shrub belonging to the angiosperm *Rhamnaceae* family. The *Ziziphus* family includes about 135–170 species (Maraghni, et al, 2010). *Ziziphus lotus*, a tropical and subtropical plant, generally grows in arid and semi-arid countries. It is a thorny Rhamnaceous plant (Sun, et al, 2011) that is broadly conveyed around the globe. It is a deciduous tree that grows very well in Mediterranean climate and can tolerate heat and aridity.

It grows widely in Asian countries such as China, Iran, South Korea, and Europe such as Cyprus, Spain, Greece and Sicily. It bears fruits that are edible and delicious and of various shapes and sizes and of great nutritional and medicinal value but has not been exploited commercially on the proper scale. The fruits can be eaten fresh, dried like dates or processed (jams, loaf, cakes, jelly, etc.). Various parts of *Z. jujuba* have different medicinal properties (Golmohammad, 2013). In Africa, it also finds habitats in the Aurès region in the northeast of Algeria, in countries with a Mediterranean coast such as Morocco, Tunisia and Libya. It is a dominant and economically important species commonly found in active sand dunes in the southern desert of Tunisia (Maraghni, et al, 2010). *Z. lotus* are very important medicinal plants of the family Rhamnaceae in Algeria (Amara and Benabeli, 2009). The fruits of *Ziziphus lotus* in the arid region are an important food source of the locals and are widely consumed. Therefore, it is important for people and animals with food shortages in arid areas in North Africa (Abdeddaim, Lombarkia and Bacha, 2014).

Jujube raw in Turkey, around the Sahara, Algeria and Tunisia, "Sedra", wild jujube in Northern Cyprus and South Cyprus in Gonnar Pallura or Konnarga to "known as. *Ziziphus lotus* peels, a bush with yellow flowers and thorns, are red; the seeds of the spherical (0.5-1cm) fruit are hard. Its leaves are bright green and oval. In *Z. lotus*, the zig-zag branched body thickness is 1-2 cm and it can extend up to 2-4 meters and spread up to 15-20 meters (Viney, 1994). Evrchou, Kalopsida, Çınarlı, Pergama, Pile, Kontea, Athenou, Larnaca, Trikomo, Keryneia, Nicosia, Gönyeli, Akçiçek, Ağırdağ are the most common areas in the Mesarya plain (Viney, 1992, Tsintides et al, 2002; İlseven, 2017). *Z. lotus*, moist soil root systems have been developed in order to reach its strata and groundwater resources. *Ziziphus* is a plant sought in lotus nutrition, health and cosmetics. It is one of the plants that bees visit most in the steppe climate. It is used in various forms such as tea, jam, juice, oil, loaf and cake. In traditional medicine, both in North Africa and the Middle East, some parts of the *Ziziphus lotus* are used as anti urinary problems, anti diabetes, skin infections, anti fever, anti diarrhea, insomnia, sedative, bronchitis and hypoglycemic. *Ziziphus lotus* fruits are also consumed as fruits (Souleymane, 2017).

Leaves and fruits are eaten by many species of birds, rabbits, goats, even foxes. Small ruminants (goat sheep) love the leaves of this bush. In the cave, shepherds graze the animals near the wild jujube to feed the dry leaves under the bush. The flowers are small, 5 mm (0.20 in) wide, with five inconspicuous yellowish-green petals. These shrubs both shelters and nutrients for foxes, rodents (hares, mice) are reptiles, hedgehogs and even spiders (scorpions and spiders) (Cancio, *at all* 2017, İlseven, 2020). The red fox (*Vulpes vulpes*) plays an important role for community-level seed distribution in the *Ziziphus* habitat. Red foxes, both meat and herbivore animals, play an important role in dispersing the seeds (Ilseven, 2020).

*Ziziphus lotus* is relatively resistant to fires compared to other bush species. After the stubble fires, 10 % of the young shoots can bloom again. More so, the decrease of the rental and resale estimation of pervaded land, this shrub influences the production of different crops. Additionally, the existence of clumps of jujube in comprises an asylum for some pest or/and their host (weeds, rodents, shellfish, Spanish sparrows, insect and microbes (Rsaissi *et al*, 2012).

## 2. RESULTS, DISCUSSION AND CONCLUSION



**Photograph 1: Most of the animals like birds, snakes, lizards, rat, hare use *Z.lotus* as their shelter.**



**Photograph 2: When wheat and barley fields are plowed, the *Z.lotus* bushes in the Mesaoria are the only shelter for wild animals (left photo). The red fox (*Vulpes vulpes*) plays an important role for community-level seed distribution in the *Ziziphus* habitat (right).**

The knowledge of the interviewed farmers about *Ziziphus lotus*; 70% of the farmers knew and recognized the *Ziziphus* shrub and 30% stated and confirmed that they did not know the plant. Of the 30% of participants who did not have information, 85% were immigrants, while the other 15% were local and new generation, all under the age of 30 (Cypriot). In order to protect this plant, in-service training should be given to immigrant farmers who do not know the effectiveness of this shrub. Because they uproot or try to uproot this shrub while ploughing their fields before planting.

In our interviews with farmers, the reason for the continued existence of the shrubs in Mesarya was that 50% of the farmers stated that they could not be uprooted 30% stated that they were fodder for small cattle (Sheep,goat), and 20% stated that they were consciously protected because they provided shelter for wild animals, especially hunting animals. Most of the participants in the survey

(50%) stated that *Z. lotus* grew by chance and that they were looking for a way to remove them, but that they had a deep root that made it difficult to get rid of them.

All those who have knowledge about the Gonnara shrub also find this shrub useful 100% know that it is useful for animals (as food, shade and shelter) 100% know that its fruit is eaten by humans 50% know that it is a shelter for animals, 30% of the interviewees want to plant a more useful tree in their field instead of Gonnara (*Zizyphus lotus*). 90% have done this (olive, pine, cypress, almond, pomegranate) They complained that the trees planted such as olive, pine, cypress, almond, pomegranate could not fully develop (66%).

Of the farmers who had knowledge about the *Zizyphus lotus* shrub, 60% had received advice from their ancestors about protecting this shrub, 26% had not received advice but had learned that this shrub should be protected because of their ancestors' sensitivity to the shrub, and 14% had not received advice.

In the Mesarya plain, where it is very difficult to grow trees due to ecological imposition, wild jujubes are the last refuge areas for the wild animals living in this ecosystem. In the vast Mesarya plain, during the ploughing season, the only place where reptiles, birds and mammals can hide is in the depths of the *zizyphus lotus* bushes. The leaves and fruits are eaten by many species of birds, rabbits, goats, sheep and even foxes. Goats and sheeps love the leaves of this shrub very much. In the mesa, shepherds graze the animals near the gonnara so that they can feed on the dry and fresh leaves under the shrub. Its inconspicuous, green to yellow flowers produce abundant nectar. These bushes provide both shelter and food for foxes, rodents (hares, mice), reptiles, hedgehogs and even arachnids like scorpions and spiders. (Grice, 1997, İlseven, 2020).

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