



Food and Agriculture  
Organization of the  
United Nations



# CONSERVATION and SUSTAINABLE MANAGEMENT of TURKEY'S STEPPE ECOSYSTEM PROJECT

GCP /TUR/ 061/GFF



Development of Management Plans for the  
Şanlıurfa Merkez Kızılkuyu WDA, Tek Tek Mountains NP  
and (Şanlıurfa Part Of) Karacadağ - LOT 2

Species Action Plan for  
Terebinth (*Pistacia palaestina* Boiss)

(2021 - 2030)





# *TEK TEK MOUNTAINS NATIONAL PARKS*



## *Terebinth (Pistacia palaestina Boiss.) SPECIES ACTION PLAN*

### SECTION I



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## LIST OF ABBREVIATION

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<b>ANÇEO</b>	Anadolu Çevre Ormancılık Haritacılık İnş. Tic. ve San. Ltd. Şti.
<b>CITES</b>	The Convention on International Trade in Endangered Species of Wild Fauna and Flora
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>GAP</b>	Southeastern Anatolia Project
<b>GDF</b>	General Directorate of Forestry
<b>GDNCNP</b>	General Directorate of Nature Conservation and National Parks
<b>GDPP</b>	General Directorate of Plant Production
<b>GEF</b>	Global Environment Facility
<b>GIS</b>	Geographic Information Systems
<b>IUCN</b>	International Union for Conservation of Nature

## PLANNING TEAM

The Terebinth (*Pistacia palaestina* Boiss.) Species Action Plan was prepared by **ANÇEO** Anadolu Çevre Ormancılık Haritacılık İnş. Tic. ve San. Ltd.Şti. within the scope of “*Conservation and Sustainable Management of Turkey’s Steppe Project*” carried out in cooperation with United Nations Food and Agriculture Organization (FAO), Ministry of Agriculture and Forestry, General Directorate of Nature Conservation and National Parks (GDNCNP), General Directorate of Plant Production (GDPP) and General Directorate of Forestry (GDF) and with the financial support of the Global Environment Facility (GEF).

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## EXECUTIVE SUMMARY

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The “**Terebinth (*Pistacia palaestina* Boiss.) Species Action Plan**”, naturally distributed in Tek Tek Mountains National Park, has been developed within the scope of “Conservation and Sustainable Management of Turkey's Steppe Ecosystems” (GCP/TUR/061/GFF).

This report covers the general information of the taxonomy, morphological characteristics, life cycle, habitat preferences, density and distribution of the species in the area and usage areas for the species to determine the threats and limiting factors for its habitat.

IUCN (International Union for Conservation of Nature) has not evaluated *Pistacia palaestina* but has evaluated the threat category of *Pistacia terebinthus*, which is a very close species taxonomically and is accepted as a synonym in some country flora, as Least Concern (LC). Therefore, *Pistacia palaestina* is considered as LC within the scope of study on the "Terebinth Species Action Plan".

*Pistacia palaestina* Boiss. is widely distributed in the eastern part of the Mediterranean basin (Palestine, Lebanon, Syria, Turkey and nearby islands). In general the *Pistacia palaestina* prefers rocky slopes and red pine (*Pinus brutia*) forests especially in hilly and mountainous areas of maquis, pseudo-maquis and garrigue formations as habitat. Similarly, the species spreads on rocky slopes in Tek Tek Mountains National Park and it is resistant to arid conditions and diseases. Especially, its intense spread in the Rüstem Creek Valley is striking. *The species has* a current natural distribution in an area of 2.255 ha in the northern part of the borders of Tek Tek Mountains National Park, covering an area of 19.335 ha.

The first sprouting of the species takes place towards the end of March. Flowering continues from April to early May. The species is anemophile, that is, pollinates by wind. Wind-pollinated plants produce a lot of pollen to increase the probability of fertilization. The first fruit formation begins in June right after pollination and accordingly fertilization, and the fruiting continues until August.

Terebinth spreads as a pure population in the area and has an important economic value as it is considered as non-wood forest products. The species also constitutes an important gene source as one of the rootstocks for pistachio (*Pistacia vera*), which is a cultural plant and has economic value. Additionally, various parts of the plant are used primarily for food and medicinal purposes. Gum which is rich in tannins and resinous substances, is a product with high added value used in stomach ailments such as ulcers, gastritis and reflux. The seeds and fruits of the species are consumed as "Menengiç coffee" and are included in the composition of some coffee varieties. It is also an important economic plant used in soap making.



Threats and limiting factors for the species were categorized and evaluated according to IUCN threat analysis criteria. Tree cutting and removal, “illegal” grazing, erosion, quarrying, fire and grafting activities are the most important threats for the species and its habitats

## 1. INTRODUCTION

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It is essential to recognize these riches in order to use the biological wealth of a country in the development of the country and to activate this economic potential.

The concept of biodiversity has recently been at the top of the agenda of countries. Great efforts are exerted to evaluate, protect and ensure the sustainability of the elements that comprise biodiversity, and accordingly, many countries take biodiversity inventories and determine their biodiversity and prepare forward-looking plans accordingly.

Countries are trying to ensure the sustainability of the protection of the biodiversity they have through both their own laws and international conventions that they are part of.

There are basically two approaches to protect biodiversity: *in situ* and *ex situ* conservation.

***In situ* (inside the natural habitat) Conservation:** means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties (CBD, 1992). Special Environmental Protection Areas, National Parks, Nature Protection Areas and Nature Parks are some examples.

***Ex situ* (outside the natural habitat) Conservation:** means the conservation of components of biological diversity outside their natural habitats (CBD, 1992). In other words, it is the protection of a living (plant or animal) species or breed that is in danger of extinction. Seed banks, Botanical gardens and Zoos are examples for this conservation method.

Turkey is one of the rich and interesting countries in terms of its plant species. According to the most recent study (Güner et al., 2012) conducted to determine the Flora of Turkey, the total number of taxa (natural, alien and agricultural plants) is about 11,707. Of these taxa, 241 are alien and agricultural plants, with a rate of 2.05%.

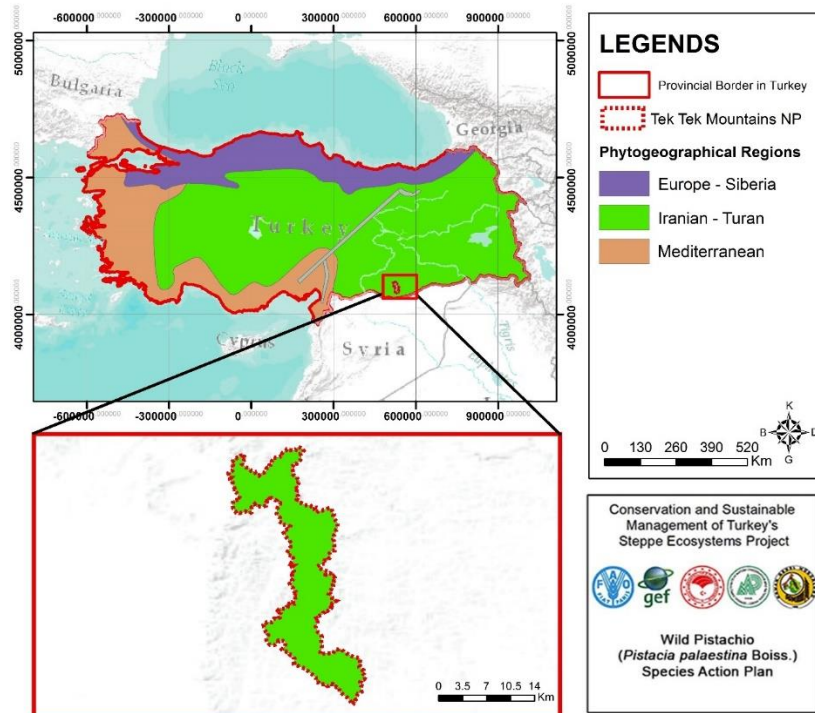
The location of Turkey is also remarkable in terms of the important gene centers of the world. People benefit from these plants for various purposes (food, medicinal, etc.) using traditional methods. Here, the region where the plants grow and the sociological structure of that region are directly effective.

The effect of negative factors on this rich vegetation is increasing every day. Accordingly, the populations of the species in different geographical regions may gradually disappear, sometimes irreversibly. The disappearance of such local populations means the disappearance of many useful genes from the gene pool of the species. This is a threat in developing solution for the problems that may be encountered in the future. In terms of preventing this, two basic concepts are important; conservation and sustainability.

## 2. GEOGRAPHICAL SCOPE

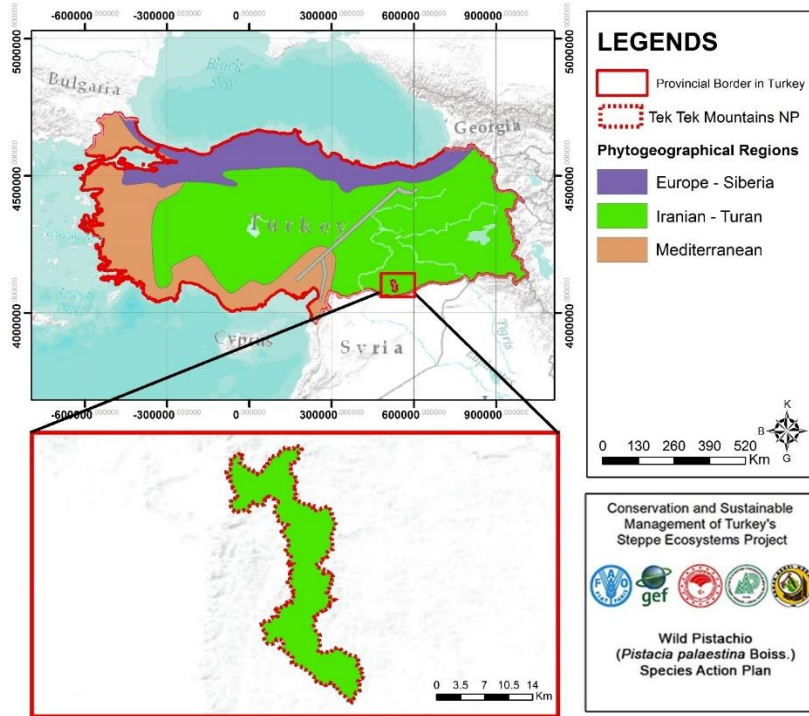
### 2.1. Description of the area

The Tek Tek Mountains, or in other words, the Tek Tek Ranges, are located 42 km east of Şanlıurfa city centre. The land, which has the appearance of a low plateau, fluctuates between the Susuz Mountains and Karakeçi, and extends for approximately 60 km in the north-south direction, crossing the Şanlıurfa-Mardin highway further south and ends at the Syrian border. Geographically, it is located in the Middle Euphrates section of the Southeast Anatolian Region, and phytogeographically, it is within the Mesopotamian province of the Iran-Turan



phytogeographic region (

**Figure 1**Error! Reference source not found.).



**Figure 1.** Phytogeographical Regions of Turkey (Source: turkeystree.blogspot.com, 2019)

Some karstic surface forms such as lapia, doline, blind valley and caves are seen in the Tek Tek Mountains. There are many cisterns here. The rains in winter fill these cisterns. There is no water source in the area. The factor that causes this is the calcareous structure of the area, which has a high infiltration ability. In addition, severe evaporation as a result of high temperature values is another factor (Guzel, 1998).

The soils on the Tek Tek Mountains are shallow red brown intrazonal soils. These soils are common in mountainous areas where erosion is continuous. Since these soils were moved to the plain without having a change to get horizons, the soil horizons did not form. Due to water and wind, the bedrock has outcropped to the surface from time to time (Atalay, 1983; Güzel, 1998).

In the research area, the effect of the Mediterranean climate is semi-arid and cool. The precipitation regime is W.S.A.S. (winter, spring, autumn, summer) and shows Eastern Mediterranean type 1. The month with the highest average temperature is July, and the coldest month is January. In the area where summer and autumn seasons are dry, the rainiest month is January and the driest month is July (Kaya, 2014).

A large part of the National Park, which was declared on an area of 19 335 hectares in Tek Tek Mountains in 2007, is within the borders of Haliliye and a very small part of Harran districts of Şanlıurfa ([www.resmigazete.gov.tr](http://www.resmigazete.gov.tr)) (Figure 2)

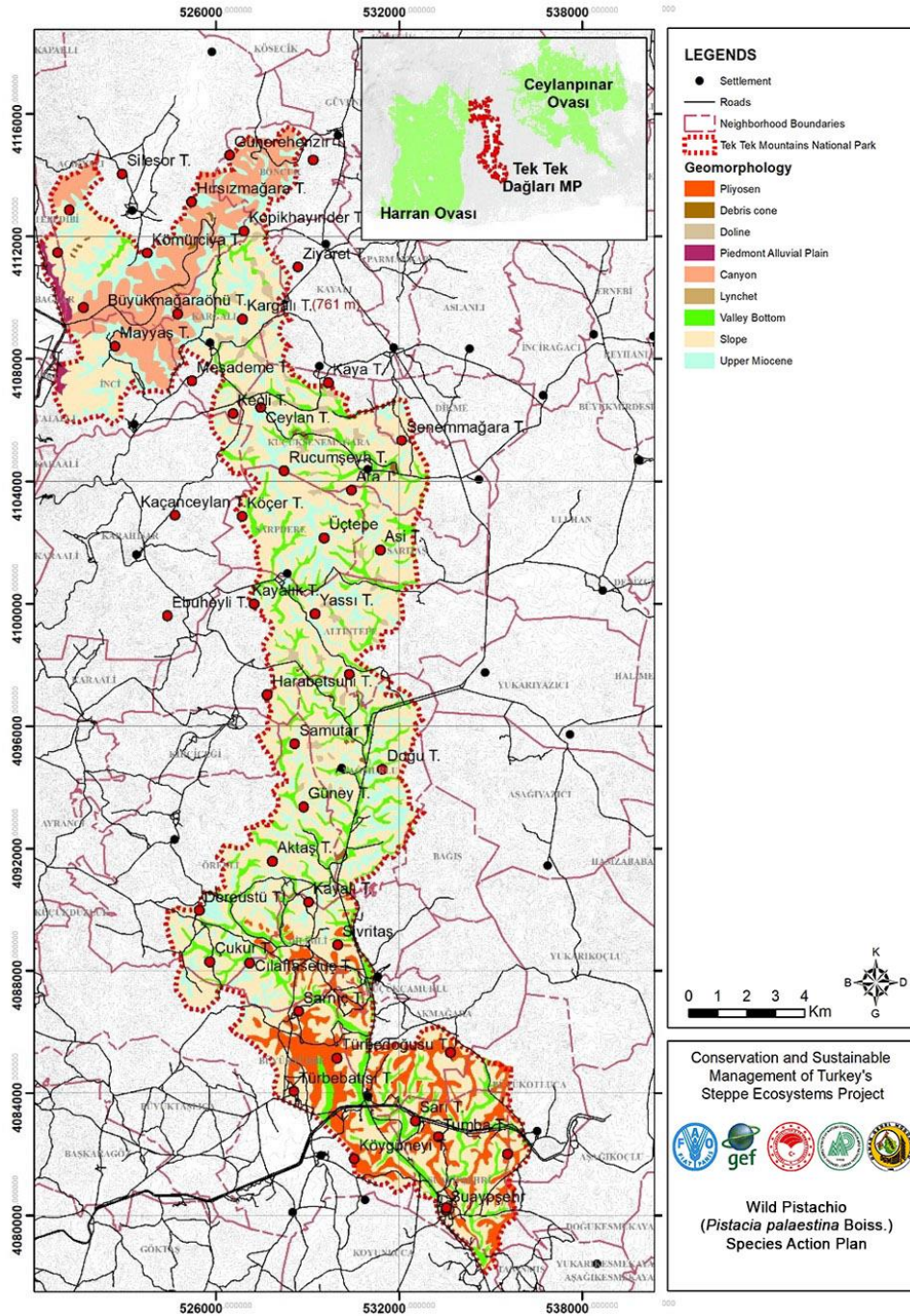
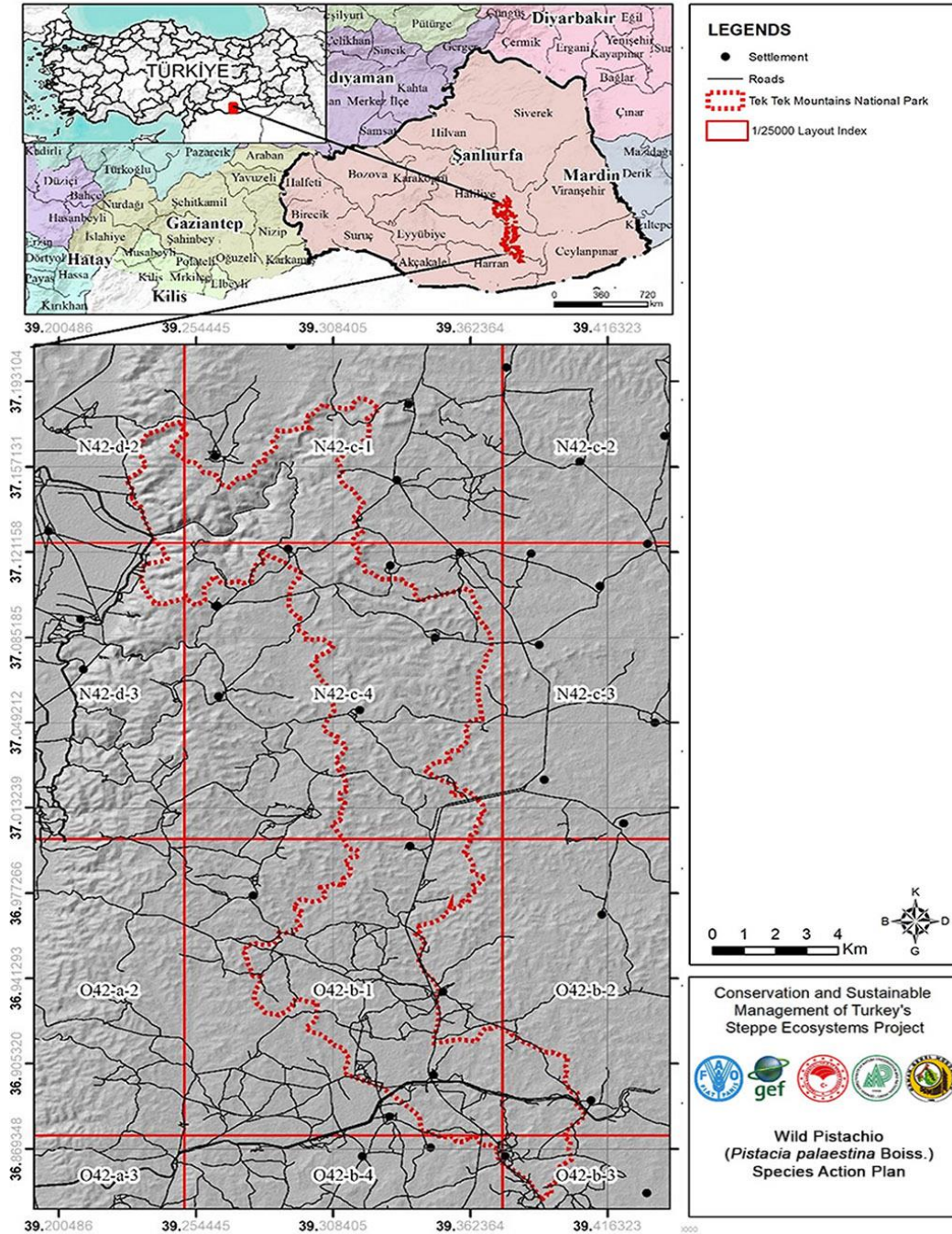


Figure 3).





**Figure 2.** Tek Tek Mountains (Plateaus)

Tek Tek Mountains, which is a hill in terms of geomorphology, is a horst (elevation) formed as a result of tectonic ruptures in the Neogene. The Harran plain is located in the west of the Tek Tek Mountains, which is in the meeting zone of the Arab and Anatolian blocks, and the Ceylanpınar plain is located in the east. Its average altitude is 530 m. and its highest point is 801 m. This mass, which consists of Tek Tek Mountains, Eocene and Miocene limestones formed at the end of Paleogene, is divided by valleys with a depth of 100 m in places due to streams flowing as a result of humid climatic conditions during interglacial periods. Today, there is no water source due to the heavy evaporation factor together with the limestone structure of the area (Guzel, 1998) (Figure 3).

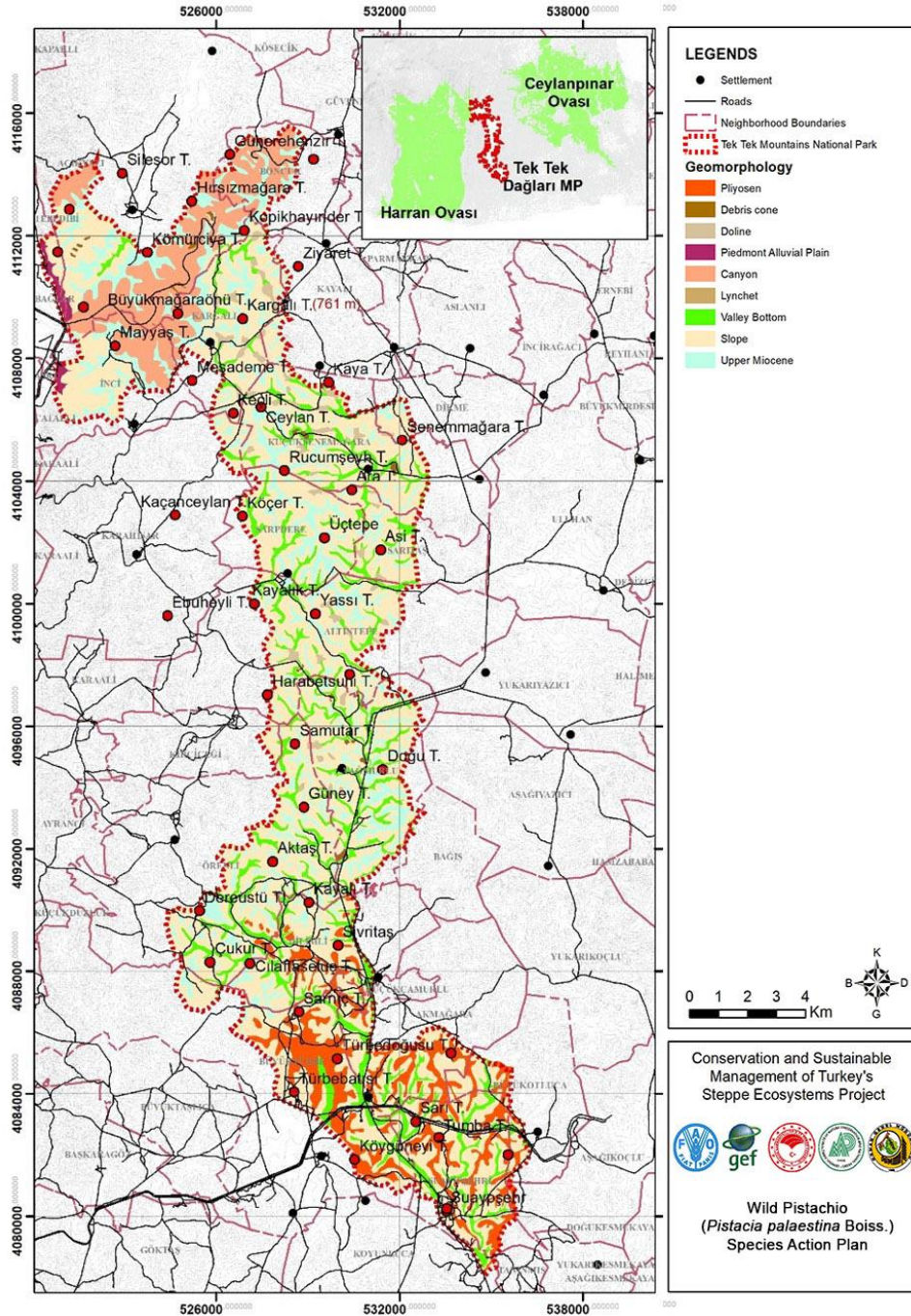
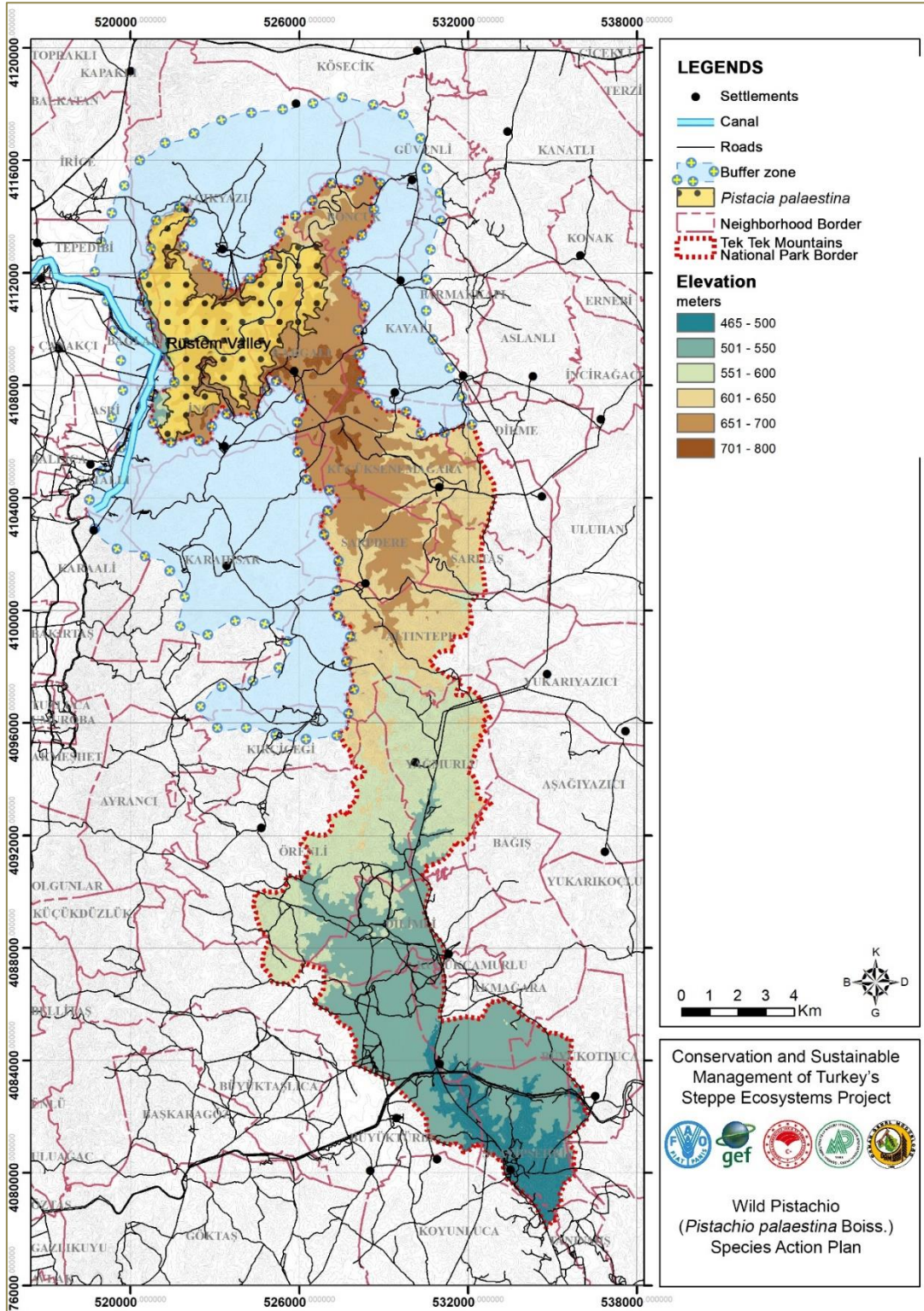


Figure 3. Geomorphological Structure of Tek Tek Mountains NP



Generally, the dominant vegetation is steppe. Rüstem Stream Valley and Silesor Stream are dominated by bush and shrub communities of *Pistacia palaestina* Boiss (Terebinth) in the northern part of the area. Today, Terebinth communities have been able to protect themselves only in the northern part of the area due to the effect of anthropogenic factors (Figure 4, Figure 5, Figure 6).



**Figure 4.** Tek Tek Mountains National Park, Buffer Region and *Pistacia palaestina* community



**Figure 5.** Rüstem Valley in Tek Tek Mountains National Park (© Ömer Faruk Kaya)



**Figure 6.** View of the Harran Plain from Tek Tek Mountains NP (© Ömer Faruk Kaya)

*Cerasus microcarpa* subsp. *tortusa* (Sarıdağ kirazı), *Lagoecia cuminoides* (pülüskün), *Crepis sancta* (yaban kıskısı), *Trifolium tomentosum* (yünlü yonca), *Trifolium stellatum* var. *stellatum* (yıldız yonca), *Teucrium polium* (acıyavşan), *Centaurea virgata* (acı süpürge), *Aegilops triuncialis* subsp. *triuncialis* (üçkılçık), *Avena sterilis* subsp. *sterilis* (şifan), *Eryngium campestre* subsp. *virens* (yer kestanesi) and *Echinaria capitata* (dikenbaşotu) are the common species encountered in the area.



### 3. DESCRIPTION OF THE SPECIES

#### 3.1. General Information

Plant samples collected from Galilee in the Palestine region by Boissier (1849) were introduced to the scientific world as *Pistacia palaestina* in the Rhamnaceae family. This species was later included in the Anacardiaceae family in the second volume of "Flora Orientalis" by Boissier (1872). In both publications, the collector number of the species sample and the date of collection were not specified, and the locality was not clearly stated. By Engler (1883), this plant was removed from the species category and recorded as a subspecies of *Pistacia terebinthus*.

In the first comprehensive study of the genus *Pistacia* by Zohary (1952), *Pistacia palaestina* was evaluated within the species category.

The taxon was again specified as a subspecies under *Pistacia terebinthus*, taking into account the classification made by Engler (1883) in the work "Flora of Turkey" by Yaltırık (1967).

*Pistacia palaestina* was expressed in the species category according to the research named "Turkey Plants List (Vascular Plants)" prepared by Güner et al. (2012) in the light of current taxonomic data.

##### 3.1.1. Taxonomy

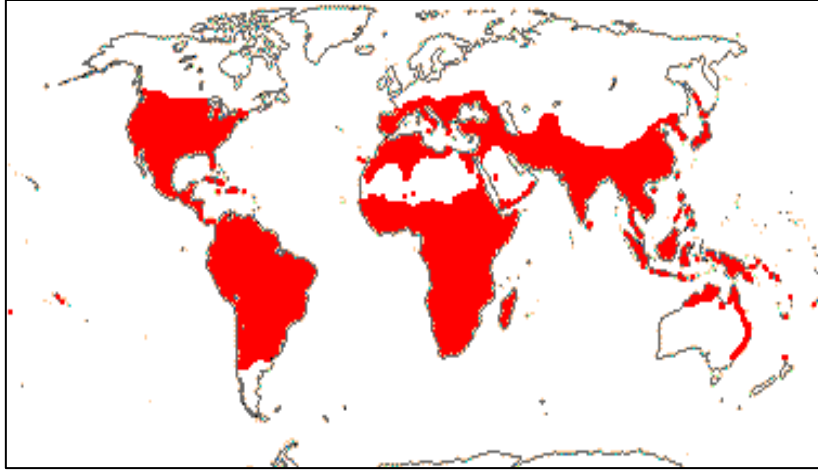
*Pistacia palaestina* (Terebinth) is a species in the family of Anacardiaceae and widely distributed especially in the Mediterranean and the Middle East.

The taxonomic hierarchy of the *Pistacia palaestina* (Terebinth) species is given below;

<b>Kingdom (Regnum)</b>	: Plantae
<b>Phylum (Divisio)</b>	: Magnoliophyta
<b>Class (Class)</b>	: Magnoliopsida
<b>Order (Ordo)</b>	: Sapindales Bercht. & J.Presl
<b>Family (Familia)</b>	: Anacardiaceae R.Br
<b>Genus (Genus)</b>	: <i>Pistacia</i> L.
<b>Species (Species):</b>	<i>Pistacia palaestina</i> Boiss.

Anacardiaceae family; usually includes trees, shrubs, lianas with resin or latex, rarely, herbaceous perennials. The resins of some taxa are allergenic. The fruits and resins of this medium-sized family, consisting of about 69-70 genera and 600-850 taxa, widely distributed from the tropics to temperate regions, are economically important and are characterized by having resin ducts nectariferous disk and a drupe fruit (Jeffrey, 1980; Simpson, 2019) (Figure 7).



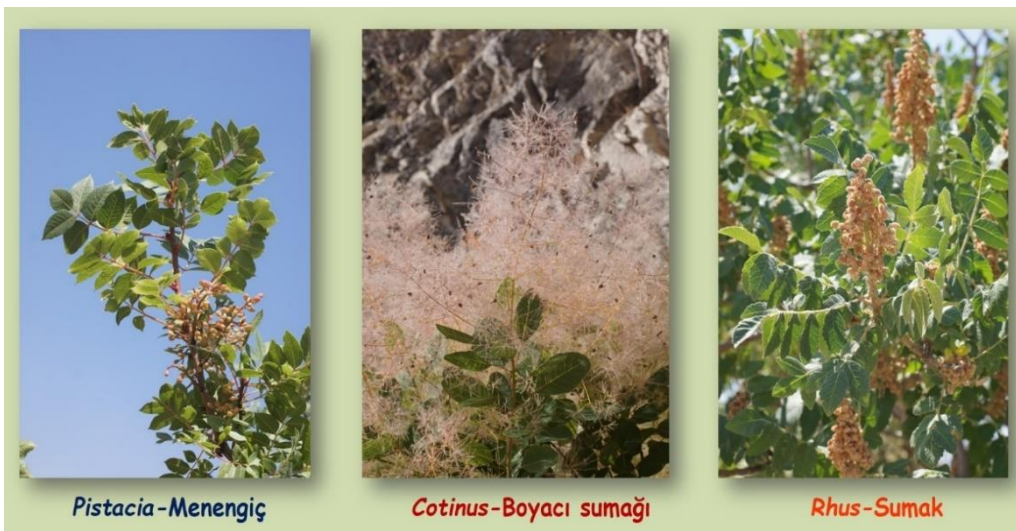


**Figure 7.** Distribution map of Anacardiaceae (<http://www.mobot.org/MOBOT/research/APweb/>)

Leaves alternate, simple, trifoliate or pinnate, rarely opposite or whorled, exstipulate or with very obscure stipules. Inflorescence a panicle at branch tips or axillae. Flowers actinomorphic, usually unisexual in function, rarely hermaphrodite. Sepals 3-5, usually fused at the base or rarely absent. Petals 3-5, free or absent. Stamens 5 or 10 free or rarely adjacent at the base. The ovary is superior (rarely inferior), usually 1 locular (3 locular by abortion). Ovules are 1(-3) and placentation is usually apical or basal. Style 1-3. The fruit is a 1-seeded drupe, often oblique and rather dry (Yaltrık, 1967; Simpson, 2019).

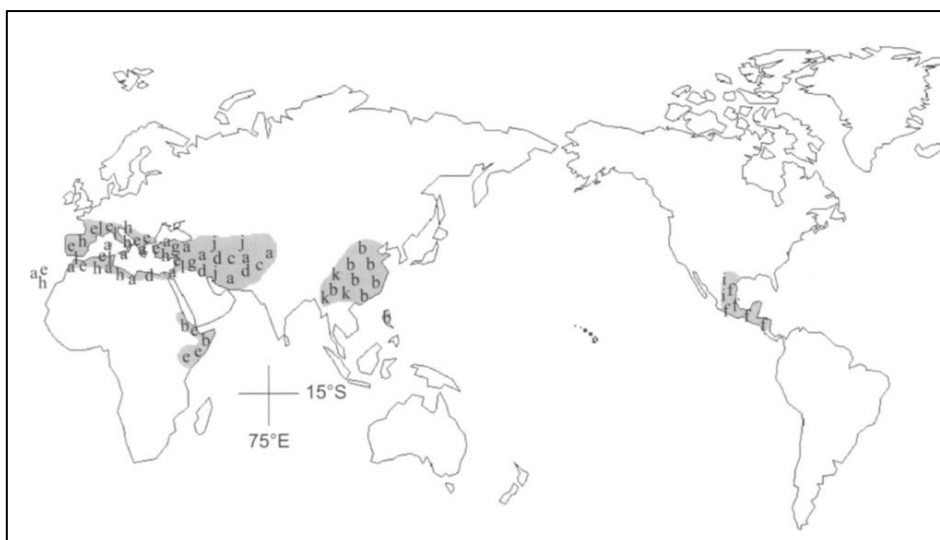
There are 3 genera (*Pistacia*, *Rhus* and *Cotinus*) and 10 related taxa in Turkey according to the current taxonomic status (Güner et al., 2012) (**Figure 8**).

The main characteristic feature that distinguishes these three genera from each other is that their leaves are simple (full) and compound (parted). In the genus *Cotinus*, the leaves are simple, while in the other two genera they are compound. The difference that distinguishes the other two genera from each other is that the edges of the leaflets are straight in the genus *Pistacia*, while they are toothed in the genus *Rhus*.



**Figure 8.** Three genera of Anacardiaceae family in Turkey (*Pistacia*, *Rhus*, *Cotinus*) (© Ömer Faruk Kaya)

Two different gene centers have been identified for the genus *Pistacia* L., which is believed to have originated in Central Asia 80 million years ago. The first of these covers the borders of Southern Europe, North Africa and the Middle East in the Mediterranean basin. The second gene center consists of West and Central Asia. Species of the genus naturally spread from North Africa to the Philippines and from Texas to Nicaragua (Al-Saghir and Proter, 2012) (**Error! Reference source not found.**).



**Figure 9.** The distribution map of *Pistacia* species (a: *P. atlantica*, b: *P. chinensis*, c: *P. integerrima*, d: *P. khinjuk*, e: *P. lentiscus*, f: *P. mexicana*, g: *P. palaestina*, h: *P. terebinthus*, i: *P. texana*, j: *P. vera*, k: *P. weinmannifolia*, l: *P. x saportae* (Yi et al., 2008)

Linne (1753) first described the genus *Pistacia* in his work called *Species Plantarum*. Linne identified 3 species of this genus; *Pistacia lentiscus*, *Pistacia terebinthus* and *P. vera*.

Engler (1883), who conducted the first monographic study on the genus *Pistacia*, defined 8 taxa. Later, Zohary (1952), who conducted the first comprehensive classification of the genus *Pistacia* L., divided the genus into four sections (*Lentiscella*, *Eu Lentiscus*, *Butmela* and *Eu Terebinthus*) and 11 taxa.

According to the study conducted by Yi et al. (2008) on the genus *Pistacia*, 12 taxa belonging to the genus, which were divided into two sections as *Terebinthus* and *Lentiscus*, were determined. These taxa are:

Lentiscus section: *Pistacia lentiscus*, *P. mexicana*, *P. x saportae*, *P. texana* and *P. weinmannifolia*

Terebinthus section: *Pistacia atlantica*, *P. chinensis*, *P. integerrima*, *P. khinjuk*, *P. palaestina*, *Pistacia terebinthus* and *P. vera*.

According to the study titled "*The Turkey Plants List (Vascular Plants)*" prepared by Güner et al. (2012) and containing the latest taxonomic updates, there are eight taxa in Turkey, seven

of which are species and one of which is hybrid. Taxa are: *Pistacia atlantica*, *P. eurycarpa*, *P. khinjuk*, *P. lentiscus*, *P. palaestina*, *Pistacia terebinthus*, *P. vera*, *P. x saportae*.

Morphological features of the genus *Pistacia* are as follows; They are deciduous or evergreen trees or shrubs. Leaves are alternate, exstipulate, usually pinnate, rarely trifoliate (three-part) or simple. Inflorescence paniculate (compound panicle) or racemous (panicle), with 1-3 small bracts and 2-7 bracteoles, petals absent or naked. Unisexual (dioecious), male flowers with 4-5 anthers in a disc, female flowers short, style 3-part, stigmas capitate and recurved usually unequal. The fruit is a 1-seeded oblique drupe. Seeds compressed, testa (seed coat) membranous, cotyledons (jaws) thick, contain oil, arc-shaped curved (Yaltırık, 1967; Zohary, 1987).

### 3.1.2. The Morphology of the Species

*Pistacia palaestina* Boiss. Diagn. Ser. 1 (9): 1 (1849) et Fl. 2: 6 (1872); Zoh., Palest. Journ. Boots. Jerusalem ser., 5: 209 (1952).

Syn: *Pistacia terebinthus* L. *palaestina* (Boiss.) Engl. in A.&C. DC., Monogr. phan. 4: 290 (1883).

Lectotype: Palestine in Galilaea, Boissier (G).

A deciduous shrub or tree that can be 2-6 (-10) meters tall. Leaves 10-25 cm, descending, petiole (petiolate), parapinnate or imparipinnate (with or without terminal leaflet), rachis semiterete or angular, wingless, crisp-puberulent, leaflets (3-) 4-5 (-6-7) paired, 3-7 x 1.2-2.5 cm, petiolulate or sessile, ovate, oblong or lanceolate, acute to acuminate-aristate, terminal leaflet always smaller than lateral or reduced to mucro. In the male plant, panicles compact, later loosening. In the male plant, the flowers are located in tightly conjoined panicles (panicula), then loosen. In the female plant, panicles divaricately branched, 8-18 cm. Male flowers on very short pedicelled, stamens usually 5. Pedicels of female flowers are prominent, elongated up to 2 mm, perianth 0.5-1.5 mm, pistil about 2 mm, style shorter than ovary. Fruit ca. 5 mm in diameter, ovoid or obovoid-globular, slightly flattened from the sides (Yaltırık, 1967; Zohary, 1987) (**Figure 10**).

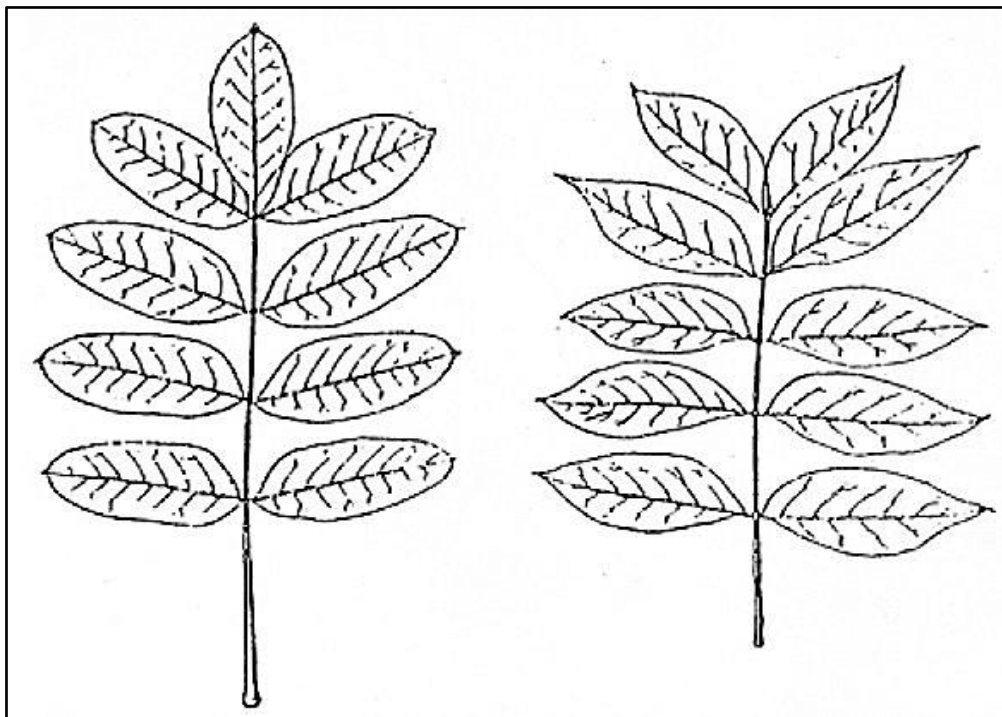
*Pistacia palaestina* Boiss. is distinguished from the taxonomically very close species *Pistacia terebinthus* L. by leaf morphology (presence or absence of terminal "end" leaflet from leaflets, if present, differing in size with lateral leaflets) and shape of leaflets and leaflet tips. (**Figure 11**).

The fact that the distinctive characters expressed here show a wide variety of variations creates problems in the identification of these two species and causes them to be evaluated as different or the same taxa. Sometimes there are plant specimens that are between the two species in terms of distinguishing features.





**Figure 10.** The most important distinguishing characters for *Pistacia palaestina* are leaf morphology and leaflet tip shape. (© Ömer Faruk Kaya)



**Figure 11.** The leaf morphology of *Pistacia terebinthus* (left) ve *Pistacia palaestina* (right) modified from Zohary (1952) (Zohary 2000)



### 3.1.3. Habitat Preferences

*Pistacia palaestina* prefers rocky slopes and red pine (*Pinus brutia*) forests especially in hilly and mountainous areas of maquis, pseudo-maquis and garrigue formations as habitat. It is found between 50-1500 meters on average (Yaltrık, 1967; Zohary, 1987).

In Tek Tek Mountains National Park, the species generally spreads on rocky slopes as a habitat. (Figure 12, Figure 13).



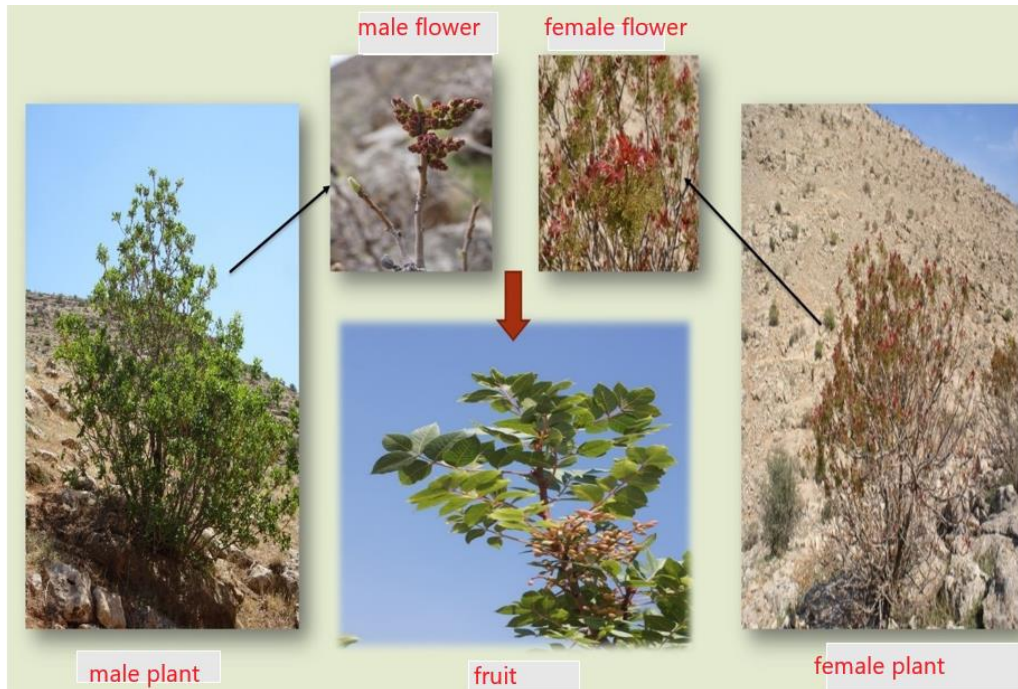
**Figure 12.** A general view from the habitat of *Pistacia palaestina* (north-facing slopes) (© Ömer Faruk Kaya)



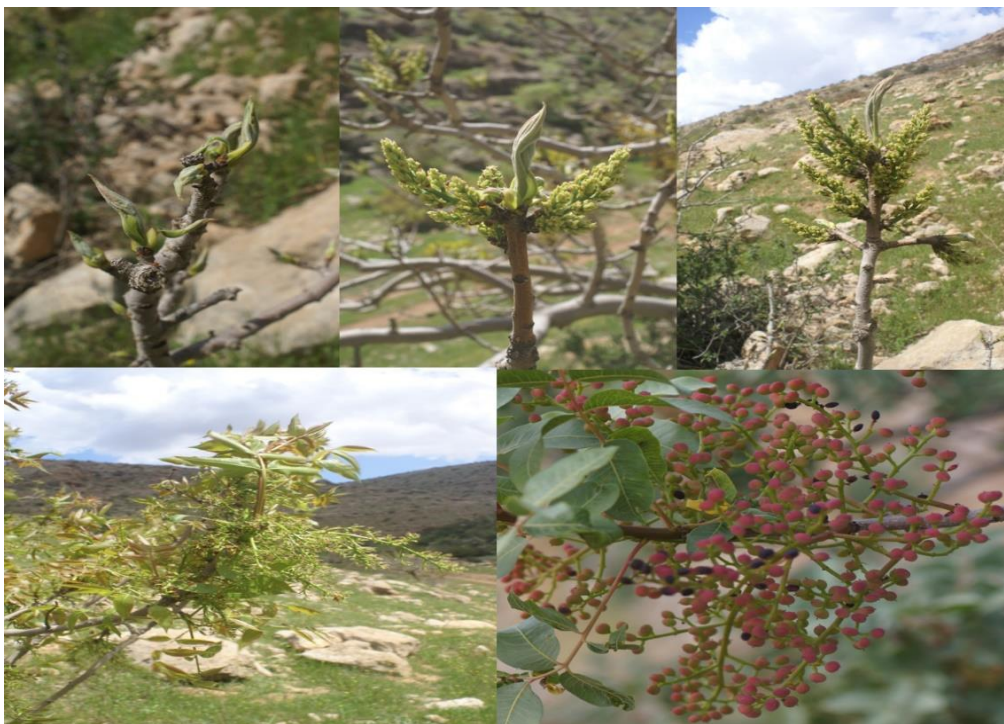
**Figure 13.** A general view from the habitat of *Pistacia palaestina* (slopes facing south) (© Ömer Faruk Kaya)

### 3.1.4. Life Cycle

The first sprouting of the species takes place towards the end of March. Flowering continues from April to early May. The species is anemophile, that is, pollinates by wind. Wind-pollinated plants produce a lot of pollen to increase the probability of fertilization. The first fruit formation begins in June right after pollination and accordingly fertilization, and the fruiting continues until August (Figure 14, Figure 15).



**Figure 14.** Pollination of *Pistacia palaestina* species (© Ömer Faruk Kaya)



**Figure 15.** Flowering and fruit formation in *Pistacia palaestina* (© Ömer Faruk Kaya)



Fruits that start to ripen as of August can be seen on the plant until October. Leaf fall begins in November. Physiological activities end between December and February (Figure 16).

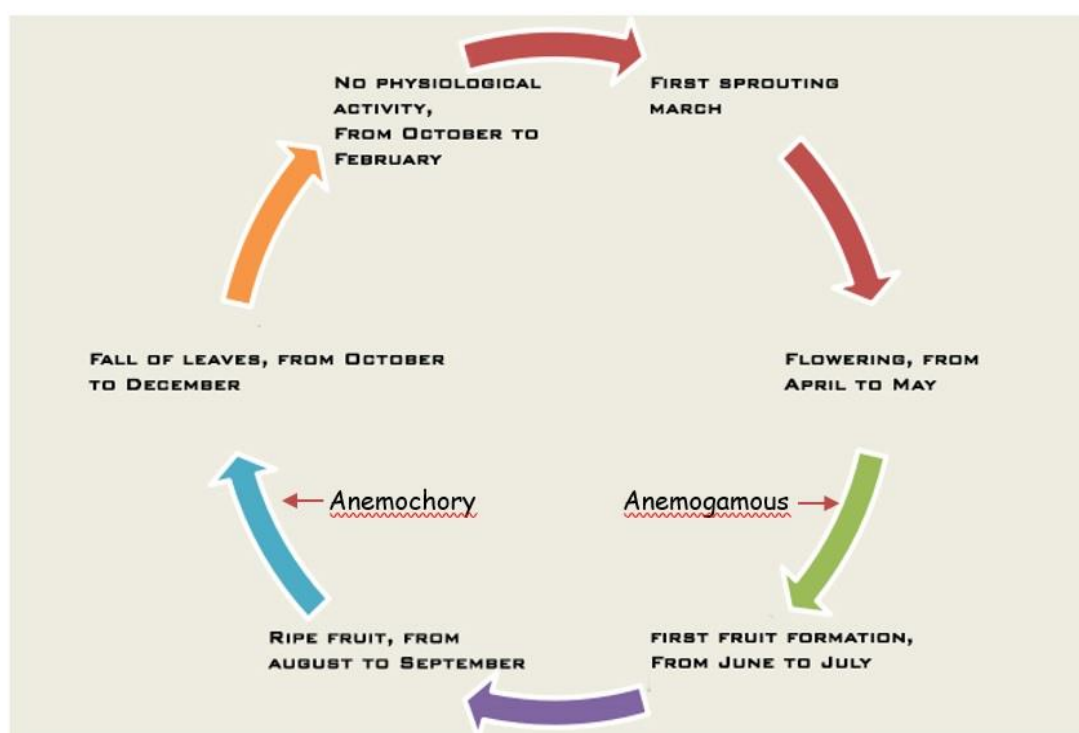


Figure 16. The life cycle of *Pistacia palaestina* species

### 3.1.5. The Usages of Species

*Pistacia* species are generally economically important. *Pistacia palaestina* is an important plant in the region in terms of non-wood products. Products obtained from various parts of the plant by traditional methods or prepared for commercial purposes are used primarily for food and medicinal purposes.

*Pistacia palaestina* is used as rootstock for the cultivar *Pistacia vera* (pistachio) because it is strong and resistant to nematodes and soil-borne fungi (Özcan, 2004). In addition, considering the drought resistance capability of the species, it shows that the species can function as a gene source in eliminating the problems that the culture form widely grown in the Southeastern Anatolia Region may be encountered.

The identified uses of *Pistacia* species are generally as follows;

While the resin formed as a result of injuries on the branches or trunk parts of *Pistacia* species or by itself, is generally called gum, it can also be called with various names such as white gum (*P. atlantica*), pistachio gum (*P. vera*) and terebinth gum (*P. terebinthus* and *P. palaestina*) according to the species. Although these gums are generally used for medical purposes, they are also used in industry (Baytop, 1984) (Figure 17).



**Figure 17.** Some uses of various parts of *Pistacia* species

These gum varieties are also known as mastic gum, mastic, mestekke, and Kızvan among the people. These gummies are widely used as flavoring and thickening agent in ice creams and desserts such as chicken breast, pudding and cookies.

The healing properties of gum varieties obtained from *Pistacia* species, such as gastritis, ulcers and reflux, are also expressed among the people.

Terebinth gum obtained from the branches of *Pistacia palaestina* species is fragrant, dark yellow or greenish gray in color and has a honey-like structure in terms of stiffness. It is used as an antiseptic in urinary and respiratory tract disorders. Peanut gum obtained from the *P. vera* species found as a result of grafting of *Pistacia palaestina* species in the area is also used in the region against stomach pains by being sucked in the mouth. It is also used as an ointment in the treatment of hemorrhoids. In addition, gall, which is formed by the effect of an insect called *Baizongia pistaciae* on the leaves of the species, is also used as a medicinal and coloring matter. The smoke produced by the burning of fresh gall is used in asthma. The leaves and young shoots of the species are used together with alum to obtain yellow color in dyeing fabrics (Baytop, 1984).

The seeds of the species are rich in oil and protein. In this oil, triglycerides of palmitic, stearic, oleic and linoleic acids draw attention. The liquid obtained as a result of roasting and crushing these fruits is consumed as "Terebinth coffee" in the region, especially in the winter months. Its fruits are also roasted and consumed as nuts (Baytop, 1984).

The fruits, which are powdered and mixed with honey, are used as a diuretic. It also has a strengthening effect (Karamanoğlu, 1977; Baytop, 1984; Tanker et al. 2007).



### 3.1.6. Conservation Status and Threat Category

The first attempt to protect the *Pistacia palaestina* species in the Tek Tek Mountains National Park was carried out in 1962 by transferring it to the (Abolished) SOIL-WATER organization. The conservation work carried out with this transfer process covers an area of 28.500 decares (2.850 hectares) where the species spread at that time. This initiative prevented the destruction of the population of the current species and helped it to survive until today. Because, in the interviews with the local people around the area where the species is distributed, they stated that there has been a decrease in the population of the species, which spread in a wider area in the past years before conservation, due to anthropogenic activities (tree cutting and removal).

In 1981, this area, located in the Tek Tek Mountains, was allocated to the Urfa Regional SOIL-WATER Research Institute under the abolished General Directorate of Rural Services. With this allocation, the institution activated the Tek Tek Soil and Water Conservation Research Station in the area. Today, this station keeps operating under the name of Tek Tek Soil and Water Conservation Research Station.

Six observatories named Regular (Darik), İnci (Naçar), Kargılı (Tekağaç), Açıkyazı (Silesor), Buç (Zakzuk) and Hayrat were established in order to observe the area in the higher parts of the area.

Today, this station continues to work only in the Station Center part of the GAP Agricultural Research Institute, which was established in 2007 under the name of Tek Tek Mountains Research Station (**Figure 23**). Other parts of the area are included within the borders of the national park.



**Figure 18.** Tek Tek Mountains Research Station (Tek Tek Mountains National Park) (© Ömer Faruk Kaya)

Grafting of the natural *Pistacia palaestina* species and converting it to the culture form *P. vera* were some of the primary establishment purposes of this station. In addition, adaptation, testing and determination of suitable varieties of olive, pomegranate, vine and almond plants were also carried out (Figure 19).

In 2007, an area of 19335 hectares including 2850 hectares of land where *Pistacia palaestina* was previously located in Tek Tek Mountains, was declared as Tek Tek Mountains National Park. Since this date, the area where the *Pistacia palaestina* population is located has gained a general protection by awarding a national status, leaving the special protection of local public institutions.



**Figure 19.** *Pistacia vera* (culture form) (© Ömer Faruk Kaya)

The activities of local public institutions for the protection of this species actually include the efforts of the natural population to graft and transform into a cultural form until the area including the population of the species is declared as a National Park. This is not a real protection. This shows that no conservation plan specific to this species has been made in the area until today. Currently, the species has a national protection since it is within the borders of the National Park.

The current species and varieties of cultivated plants include genotypes adapted to the ecological characteristics of the region as well as human selection. Today, new gene sources are needed in order to have the desired characteristics of culture varieties. Therefore, wild relatives of cultivated plants have an important potential as a gene source.

On the other hand, the spread of varieties preferred for market economy and high yield causes the extinction of genes other than these genotypes.

Unfortunately, no study has been carried out to date to benefit from one or more of the aforementioned features of the natural population in the area for the *Pistacia palaestina* species. The only thing known about the population in the area was that some of the existing wild species were converted into cultivated form by grafting. Only coffee is known from the economic features of the species in the region and it is consumed as nuts. However, there is no study to operate it for different usage purposes from both the wild form and the cultivated form.

### 3.2. Distribution and Population Status of *Pistacia palaestina* in the World and Turkey

#### 3.2.1. The status in the World

*Pistacia palaestina* Boiss. is widely distributed in the eastern part of the Mediterranean basin (Palestine, Lebanon, Syria, Turkey and nearby islands). It is an Eastern Mediterranean element phytogeographically (Zohary, 1987).

*Pistacia palaestina* and *Pistacia terebinthus* species, which are taxonomically close to each other and distributed throughout the Mediterranean basin, are also accepted as vicarious species. Accordingly, *Pistacia palaestina* has a wider distribution in the eastern part of the Mediterranean basin, and *Pistacia terebinthus* in the western part (Boissier, 1872; Zohary, 1952; Zohary, 2000) (Figure 20).

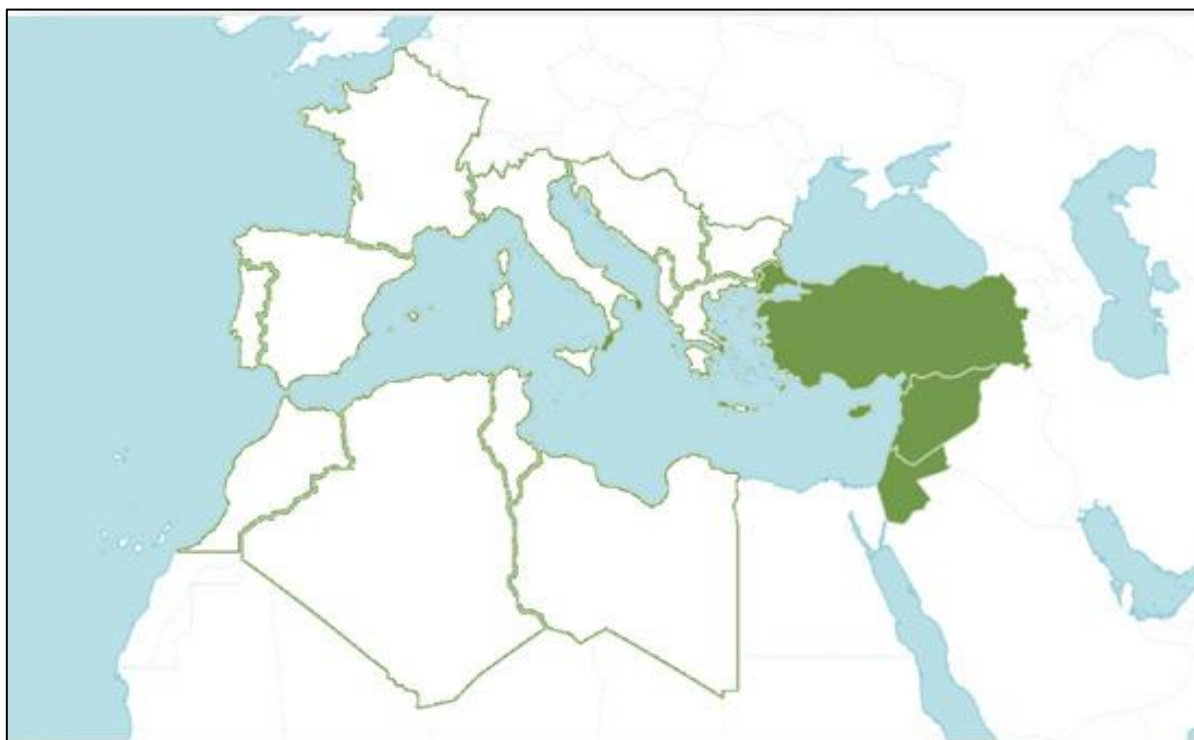


Figure 20. General distribution map of *Pistacia palaestina* (adapted from <http://www.plantsoftheworldonline.org>)

### 3.2.2. The status in Turkey

In Turkey, the species grows naturally in mountainous and rocky areas in Aegean, Mediterranean, Central Anatolia and Southeastern Anatolia (Figure 21).

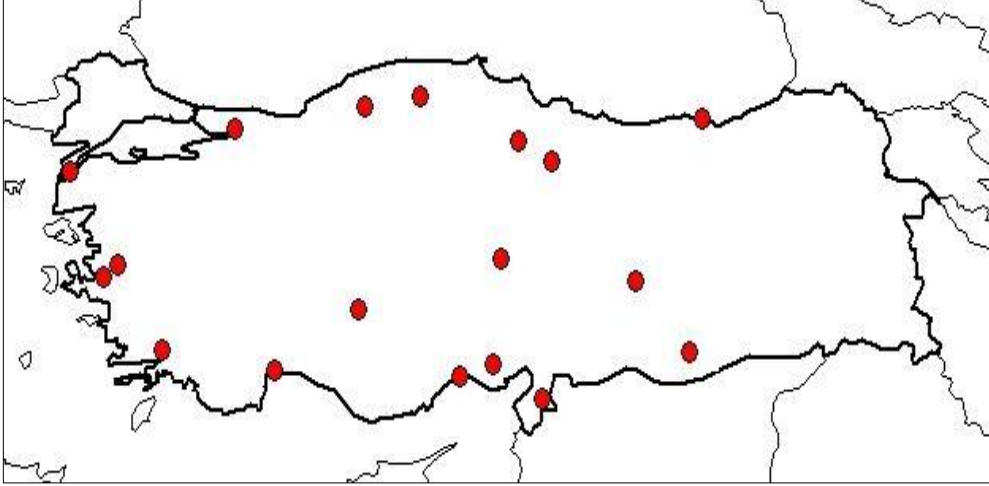


Figure 21. Distribution of *Pistacia palaestina* species in Turkey (adapted from <https://bizimbitkiler.org.tr/>)

When the distribution of the population of the species in the world and Turkey is examined, it can be seen that it spreads dispersedly in its habitats such as maquis, and garrigue vegetation types.

The population of the species found in the Tek Tek Mountains National Park shows itself as a dominant species that determines the physiognomy in its habitat. In fact, in the phytosociological study conducted by Kaya (2014), this plant community, in which the species is dominant, was introduced to the scientific world as a new plant association.

The literature surveys show that the species is not a dominant population in any habitat where it spreads, as in the Tek Tek Mountains National Park. This situation shows us very clearly that the Terebinth community in Tek Tek Mountains National Park is a very important gene source because of both with the aforementioned aspect and being a rootstock for the *Pistacia vera* (pistachio) species, which has economic importance. Accordingly, the importance of this population emerges spontaneously.

### 3.2.3. The status (Distribution and Population) in Tek Tek Mountains National Park

Today, a dominant population of natural Terebinth vegetation in Tek Tek Mountains is encountered only in the northern part of the Tek Tek Mountains National Park borders. In addition, outside the borders of the National Park, Terebinth populations consisting of 3-4 individuals have been encountered in the rocky area, 20 km from the existing natural population by crow flight distance.



In the interview with the people living in the vicinity of Tek Tek Mountains, the elders narrated their own experiences about the Terebinth plant, while the younger ones reported what they heard from their elders. According to the narrations, while there were dispersed Terebinth plants in various parts of the area in very small groups about 80 years ago, unfortunately they were cut for the supply of fuel. In fact, an old man from the local community stated that he and his father personally removed the plant from the rocky areas.

The population, which was in the Tek Tek Mountains since 1962 by the General Directorate of Topraksu (Abolished), as it was called at that time, has been taken under "protection" today in the northern parts of the National Park borders. Because of such protection status, the population has survived to the present day. However, a part of this protected natural population has unfortunately been grafted and transformed into a culture form.

The information given by the local people and the existence of this new locality show us that Terebinth had a wider distribution in the Tek Tek Mountains in the past. Unfortunately, the population of the species has been largely destroyed in the area as a result of the regressive succession caused by the effect of other anthropogenic factors, especially tree cutting and removal.

In the light of the results obtained, the current and historical possible distribution area is given in **Figure 22**, taking into account the habitats preferred by the plant.

According to the floristic study carried out by Kaya and Ertekin (2009) in the study area, aside from Terebinth (*Pistacia palaestina*), yellow mountain cherry (*Cerasus microcarpa* subsp. *tortusa*), fig (*Ficus carica* subsp. *rupestris*) and hawthorn (*Crataegus azarolus* var. *azarolus*) plants also exist. A draft stand data map was created using GIS

A field study was conducted in order to obtain data on the density and distribution of the current population within the distribution area of the species. A draft stand map was created using GIS (Geographical Information System) tools in the area where Terebinth has been distributed. Since a homogeneous distribution was observed throughout the area, 89 points were determined by considering 300x300 intervals (in some areas, this spacing distance was not taken into account in order to determine the distinction between grafted individuals and different species) (**Figure 23**).

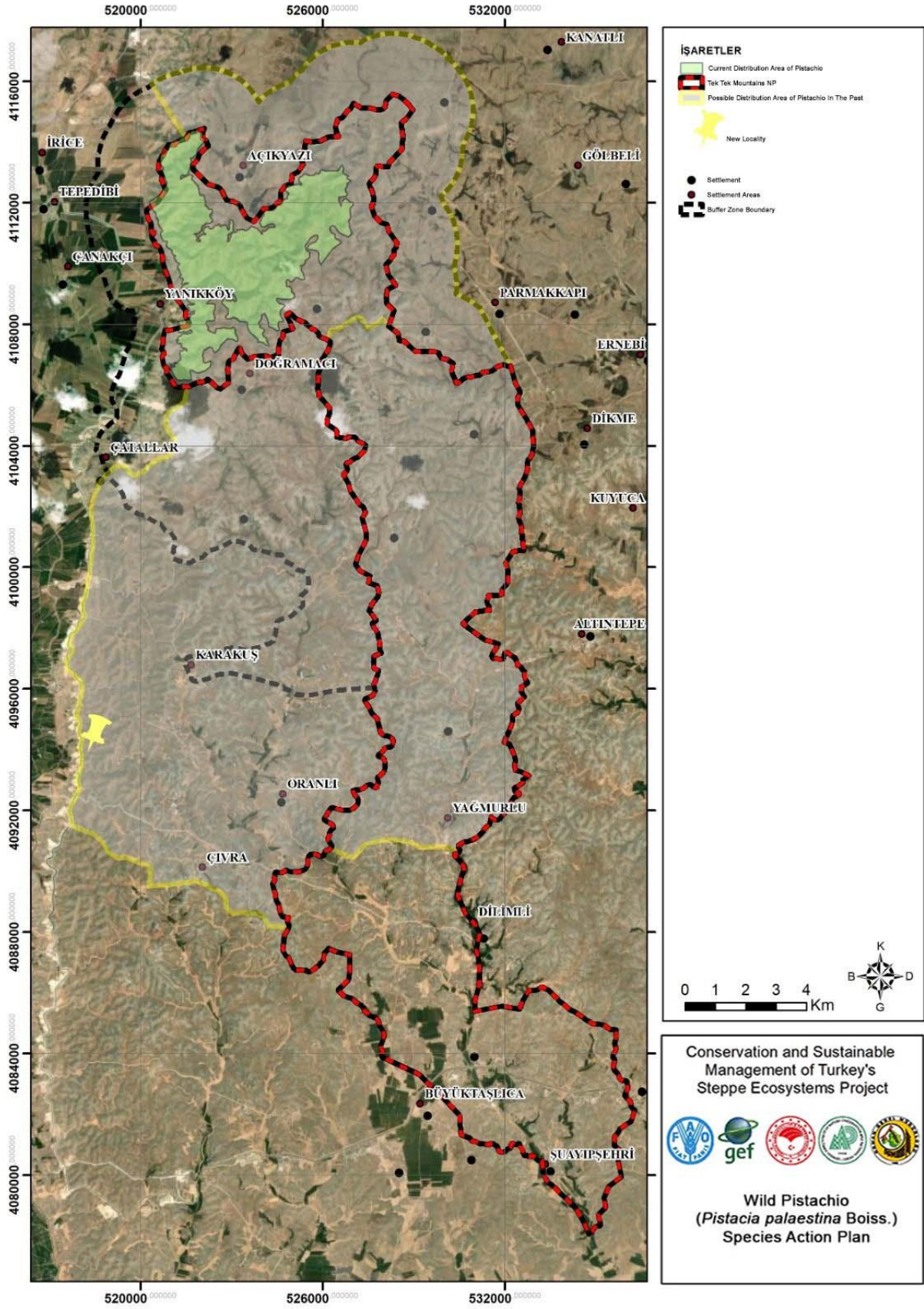
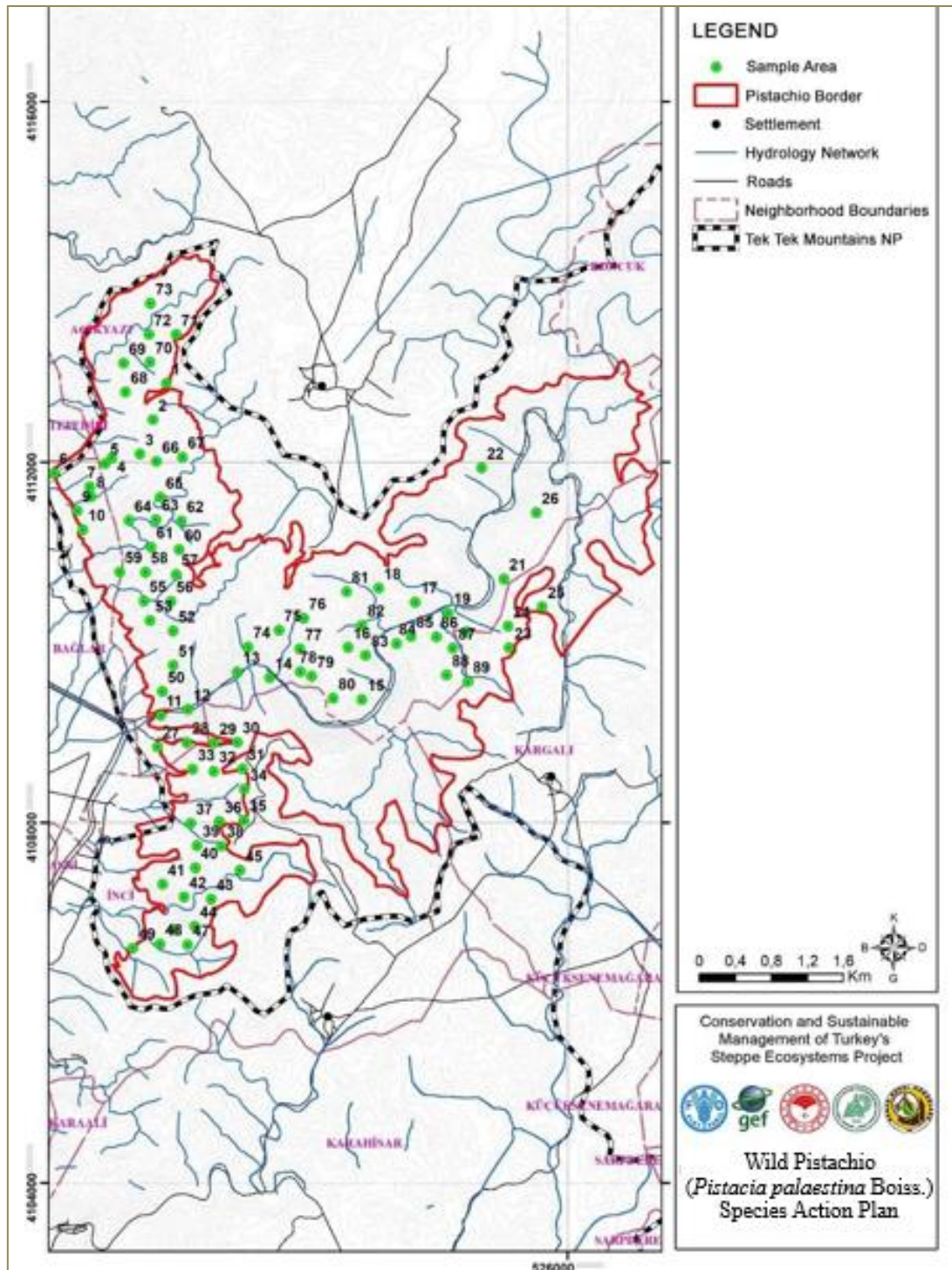


Figure 22. Current and historical probable distribution areas of *Pistacia palaestina* in Tek Tek Mountains





**Figure 23.** The distribution areas and sample points of *Pistacia palaestina* in Tek Tek Mountains NP.

These identified sample plots were taken as 800 m<sup>2</sup> (sample area radius is 15.96 m) circular areas in size based on the topographic structure of the area. After reaching these pre-determined sample areas in the field, a central point was determined. Considering the radius, the outer boundaries of the measurement area were determined by turning it clockwise starting from the north with the help of the rope marked at a length of 15.96 m. Each individual entering within 800 m<sup>2</sup> plot was measured by recording on the inventory report sheet.

As a result of the evaluation of 89 inventory sheets obtained through field survey, the weighted average of 800 m<sup>2</sup> plots was found to be 0.14045. This corresponds to approximately 61 trees per hectare (ha). General field data is obtained by multiplying the 61 trees per hectare with the areal data. According to this result, it was determined that the Terebinth covered area has a total distribution area of 2255 ha (Table 1).

**Table 1.** The number of individuals per hectare (ha) by species

Species	Individuals per ha
1. <i>Pistacia palaestina</i>	38,06179775
2. <i>Pistacia vera</i>	12,07865169
3. <i>Cerasus microcarpa</i> subsp. <i>tortusa</i>	10,25280899
4. <i>Ficus carica</i> subsp. <i>rupestris</i>	0,421348315
Total individuals	60,81460674
Total area (ha)	2255

As a result of the survey carried out in the Terebinth area (2255 ha), taking into account the inventory reports, it was determined that there were a total of 137,136 plants as shrubs. The analyzes of the species of these plants are shown in Table 2.

**Table 2.** The number of individuals in the whole area by species

Species	Individuals
1. <i>Pistacia palaestina</i>	85.829,35
2. <i>Pistacia vera</i>	27.237,35
3. <i>Cerasus microcarpa</i> subsp. <i>tortusa</i>	23.120,08
4. <i>Ficus carica</i> subsp. <i>rupestris</i>	950,1404
Total Number of Individuals in the Whole Area	137.136,93

This study is very important and valuable in that it is the most comprehensive data analysis for the determination of the plants belonging to the shrub species in the Terebinth area after the area was taken under protection in 1962. These data will be a starting point for future studies in the planning process in terms of the size of the Terebinth area, the number and varieties of the species.



## 4. RELEVANT NATIONAL LEGISLATION AND INTERNATIONAL CONVENTIONS

### 4.1. National Legislation

It is important to protect the population and habitat of *Pistacia palaestina* in the Tek Tek Mountains National Park. This species is one of the important components of the ecosystem in its habitats. The Ministry of Agriculture and Forestry, the Ministry of Environment, Urbanization and Climate Change, the Ministry of Tourism and local organizations have obligations regarding the necessary measures within the scope of the legally binding conventions.

Article 9 – (Amended: 26/4/2006-5491/6 Art.) of the Environmental Law ([www.mevzuat.gov.tr](http://www.mevzuat.gov.tr)) under the title of environmental protection determines the framework of the protection that should be performed at the national level. According to the relevant clauses a, c, f and g of this article;

- (a) *It is essential to protect the biological diversity that makes up the natural environment and the ecosystem that hosts this diversity. The principles of protection and use of biological diversity are determined by taking the opinions of local governments, universities, non-governmental organizations and other relevant organizations.*
- (c) *Areas that have been taken under protection by national legislation and international conventions that we are a party to, and sensitive areas with ecological value must be shown in plans of all scales. Areas with conservation status and areas with ecological value cannot be used outside of the plan decision.*
- f) *In order to ensure the sustainability of biological diversity, it is essential to protect the endangered or threatened species and rare plant and animal species, and it is prohibited to trade them in violation of the legislation.*
- (g) *Administrative, legal and technical principles necessary for the protection of natural resources and assets, prevention of pollution and destruction and improvement of their quality are determined by the Ministry.*

As stated in the National Plan for Plant Diversity, “*the general objectives of The National Plan od In-situ Conservation of Plant Genetic Resources are to determine the priorities and strategies in order to continuously protect the genetic diversity of the plants determined as the target species, to ensure their sustainable use and management, and to implement them for the protection of genetic diversity at the national level. With protection programs for these objectives; both plant genetic diversity and the protection of biological diversity and the natural environment will be ensured. In addition, necessary genitor material will be provided for cultivar development (plant breeding) studies*”.

In addition, the "Prohibited Activities" specified under the Protection title of the Fifth Section of the National Parks Law (11/8/1983-18132) ([www.mevzuat.gov.tr](http://www.mevzuat.gov.tr)) ensures the protection of the species within the borders of the National Park. According to this article;

- a) *Natural and ecological balance and natural ecosystem value cannot be disturbed,*
- b) *Wildlife cannot be destroyed,*
- c) *All kinds of interventions that cause or may cause the loss or alteration of the characteristics of these areas, and any work or operation that will cause soil, water and air pollution and similar environmental problems, cannot be carried out,*
- d) *Production of all kinds of forest products, hunting and grazing that would disturb the natural balance cannot be done,*

Within the framework of the above-mentioned national legislation, the species has general protection in terms of being a component of biodiversity in general.

#### 4.2. International Conventions

When evaluated in terms of the conventions that Turkey is a party of, regarding the *Pistacia palaestina* and its natural habitat;

The species is not mentioned within Annex-I List of the BERN Convention (Convention on the Conservation of European Wildlife and Habitats, 1979-Bern) and Supplementary Lists of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973-Washington). Accordingly, *Pistacia palaestina* does not have any conservation plan at the international level under the existing conventions.

IUCN (International Union for Conservation of Nature) has not evaluated the *Pistacia palaestina*, but has evaluated the threat category of *Pistacia terebinthus*, which is a very close species taxonomically and is accepted as a synonym in some country flora, as Least Concern (LC).

The assessments made by the IUCN for *Pistacia terebinthus* seem valid for *P. palaestina*. For the *Pistacia palaestina*, it is recommended as a Least Concern threat category on a global scale when evaluated according to IUCN (2021), because the threats to its extinction are uncertain and its natural distribution is widespread in Turkey and the world. The species was evaluated according to the following classes and criteria;

Least Concern (LC): A category on the IUCN Red List of Threatened Species which indicates that a taxon has been evaluated against the Red List criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category (IUCN, 2021).

## 5. THREATS and LIMITING FACTORS

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In conservation projects, a set of standard terms (Classification Plans) have been developed for documenting taxa in the IUCN Red List to ensure the analysis of data and consistency in defining the habitat a taxon is found in, what conservation actions are available or necessary against threats to the taxon and whether the taxon is benefiting from it (IUCN, 2012a).

These Classification Plans for Threats and Required Conservation Actions were obtained as part of a joint venture between the IUCN Red List Partnership and the Conservation Measures Partnership (CMP). Developed and maintained by the The Conservation Measures Partnership (CMP), “Open Standards for Conservation Practice” bring together common concepts, approaches and terminology to help conservation efforts be more effective. With this common classification plan, it is tried to find common problems and solutions under the concepts of a standard common threat, stress, timing, habitats, necessary protection actions and on-site protection actions (Open Standarts for the Practice of Conservation, 2020). In this project, it is intended to determine the protection action plans by identifying the threats it faces, the stress it is exposed to in the face of these threats and the extent of the damage based on the sustainability of the *Pistacia palaestina* species, which is a dominant population that determines the physiognomy only in the northern parts of the Tek Tek Mountains National Park in Şanlıurfa.

Information on the population and habitat of the species in Şanlıurfa province is limited to the literature (Kaya and Ertekin, 2009; Aydoğdu et al., 2013; Kaya, 2014), and until now there is no information on actual and potential threats to the population.

In the field studies carried out during the preparation phase of the action plan, the observed and determined threats and their effects on the single population of *Pistacia palaestina* species in the habitat in Tek Tek Mountains National Park and their levels are shown in **Error! Reference source not found.** based on the “Unified Classification of Direct Threats” (IUCN, 2012a) and the “Threat Impact Scoring System” (IUCN, 2012b) prepared by IUCN.



**Table 3.** IUCN-Unified Classification of Direct Threats for the species *Pistacia palaestina*

Threat category	Threats (Description –Sample)	Coverage <sup>1</sup>	Threat level <sup>2</sup>	Impact score <sup>3</sup>		
				Past	Today	Future
1. Settlement & Commercial Activities	-	-	-	-	-	-
2. Agriculture & Aquaculture (2.3.2.)	<b><u>Illegal "grazing"</u></b> -Decrease in the number of individuals in the population and disappearance as a result of the destruction of their shoots -Weakening in the floristic structure of the vegetation	2	2	8	6	4
3. Energy Generation & Mining (3.2.)	<b><u>Stone pit</u></b> Disruption of possible distribution of population due to quarry	1	1	3	5	5
4. Transportation & Service corridors		-	-	-	-	-
5. Biological Resource Use (5.3.1.)	<b><u>Tree cutting and removal</u></b> Reduction in the number of individuals in the population and disappearance over time due to its use as fuel	1	1	9	4	3
6. Human Interventions & Decay		-	-	-	-	-
7. Natural System Changes (7.1.3.)	<b><u>Fire</u></b> population or species loss. Fire pressure in the habitat is one of the factors that threaten the population, even if it is small.	0	0	1	1	1
8. Invasive & other problematic species, genes & diseases		-	-	-	-	-
9. Pollution (9.3.2.)	<b><u>Erosion</u></b> Damage to the population's habitat	1	1	6	4	3
10. Geological Phenomena	<b><u>Stone pit</u></b> Due to the closure of stomata in the population due to dust originating from the quarry, drying of individuals or failure of young individuals to develop	1	0	1	2	1
11. Climate Change & Major Weather Events		-	-	-	-	-
12. Other Options	<b><u>Grafting studies</u></b> The extinction of the natural population, the source of the gene	1	0-	8-	0-	0-

<sup>1</sup>**Coverage score:** Affects the entire population (>90%) (3) Affects the majority of the population (50-90%) (2) Affects a small portion of the population (<50%) (1) Unknown (0)

<sup>2</sup>**Threat level score:** Very fast (3) Fast (2) Slow (1) Fluctuating (1) Negligible (0)

<sup>3</sup>**Impact score:** High (8-9) Medium (6-7) Low (3-5) Negligible (0-2)

## 5.1. Direct Threat Factors

These factors are those that directly affect the population of the species.

### a. "Illegal" grazing

The area where the species is distributed is under protection due to its National Park status. According to this status, grazing is prohibited in the area. Unfortunately, despite this, there is "illegal" grazing in the area. This grazing affects the species directly and indirectly. As a direct effect, the development of the plant, especially the young individuals, is interrupted due to the eating of the new shoots of the Terebinth plants by the goats grazing in the field. The indirect effect is the destruction of the lower cover of the Terebinth community by sheep and cows and their removal over time. As it is known, an ecosystem refers to a whole, and the damage to the living organisms coexisting here can cause the deterioration of the whole ecosystem. In addition, the destruction of this vegetation also increases the negative effect of the erosion factor (Figure 24).



**Figure 24.** "Illegal" grazing activities in the area (© Ömer Faruk Kaya)

Depending on the continuation of this threat factor, it is inevitable that both the Terebinth population and the vegetation with which it interacts will be destroyed in the future.

### b. Tree cutting and removal

The areas where the natural population of Terebinth (*Pistacia palaestina*) are found have natural roughness in terms of topography. The species is generally found on rocky slopes in these areas. In the central parts of the distribution area, the population spreads on relatively steep slopes where the slope is high. It is stated that both the cutting and the removal of the plant for fuel purposes are sporadically conducted from time to time in the margins of the distribution area of the species, that is, in the areas where the topographic structure is plain and the slope is very low, although it is not as intense as in the past.

This will cause to a decrease in the population of the species in terms of individuals and gradually weakening. It would be useful to raise awareness of people in the surrounding villages around the distribution area of the species.

### **c. Erosion**

Unfortunately, the soil layer is negatively affected as a result of wind and water erosion due to the rugged nature of the habitat of the species and the presence of places with high slopes. It has been observed that especially the steep slopes facing south are very weak in terms of the presence of the species. The effect of the extreme temperature factor should not be overlooked. This is a natural phenomenon. The habitat should be monitored in this regard (**Figure 25**).



**Figure 25.** South-facing slopes with poor vegetation due to erosion, extremes temperature  
(© Ömer Faruk Kaya)

### **d. Grafting studies**

After the Terebinth population was taken under protection in 1962, some of it was transformed into a culture form by grafting. There is no data available on what proportion of the population this grafting is for. In addition, during the studies carried out in the field, it was witnessed that ideas were expressed on the point of instilling existing natural Terebinth into the economy.

Although there is no grafting program at the moment, it will cause the disappearance of a natural gene source if it is implemented. It is very important to naturally maintain the population with the exception of currently grafted individuals.



## 5.2. Indirect Threat Factors

These factors are factors that indirectly affect the population of the species.

### a. Quarry

The dust generated by the quarry, which is located close to the habitat of the species outside the border of the National Park, can cause negativity not only for the Terebinth plant, but also for the entire vegetation. Dust coming out of the quarry and dispersed by the wind can cause the pores (stoma) of the plants to close, weakening or drying out in the generative (blooming) stage. This may affect fruit yield. All these may result in the weakening of the population over time (Figure 26).



**Figure 26.** The quarry located near the distribution area of the species (© Ömer Faruk Kaya)

### b. Fire

Fire pressure is low in the habitat of the species. The presence of dry grass in the area due to the high temperature is observed. A possible fire could weaken the population of the species as well as other plant species in the area

## LITERATURE CITED

- Al-Saghir, M.G., Porter, D.M. 2012. Taxonomic revision of the genus *Pistacia* L. (Anacardiaceae). American Journal of Plant Sciences, 3(1): 12-32.
- Aydođdu, M., Gzel, A., Src, A., Aydođdu, M.H., ullu, M.A. 2013. Tektek Platoları Antepfıstıđı Florasının ve Ađa Sayılarının Uzaktan Algılama ve Cođrafi Bilgi Sistemleri Teknikleri Kullanılarak Belirlenmesi. Journal of Turkish Studies, 8 (12): 109-120.
- Baytop, T. 1984. Trkiye'de Bitkiler ile Tedavi. İstanbul niversitesi Yayınları, İstanbul.
- Boissier, E. 1849. Diagnoses plantarum novarum praesertim Orientalium nonnullis Europaeis Boreali-Africanisque additis. Series secunda. N.º 9. Soc. Phys. Genev. Sodali.
- Boissier, E. 1872. *Pistacia*. In: Flora Orientalis, Vol. 2, pp. 5-8, Geneva & Basel.
- CBD 1992. Convention on Biological Diversity. Secretariat of the Convention on Biological Diversity, Montreal, Canada
- epel, N. 1997. Biyoeřitlilik nemi ve Korunması. Tema Yayınları, 40 s., İstanbul.
- Engler, A. 1883. *Pistacia*. In: A & C. De Candolle (eds.), Monographiae Phanerogamarum, Vol. 4, pp. 285-293. Paris.
- Gner, A., Aslan, S., Ekim, T., Vural, M., Baba, M.T., 2012. Trkiye Bitkileri Listesi (Damarlı Bitkiler). Nezahat Gkyiđit Botanik Bahesi ve Flora Arařtırmaları Derneđi Yayını, 1290 s., İstanbul.
- Gzel, A. 1998. 19. Tek Tek dađları batısının fiziki cođrafyası. Gazi niversitesi, Sosyal Bilimleri Enstits, Yksek Lisans Tezi, Ankara, 97 s.
- IUCN (International Union for Conservation of Nature), 2012a. Threats classification scheme (version 3.2). Retrieved from <https://www.iucnredlist.org/technical-documents/classification-schemes/threats-classification-scheme>.
- IUCN (International Union for Conservation of Nature), 2012b. [https://nc.iucnredlist.org/redlist/content/attachment\\_files/Dec\\_2012\\_Guidance\\_on\\_Threat\\_Impact\\_Scoring\\_Revised.pdf](https://nc.iucnredlist.org/redlist/content/attachment_files/Dec_2012_Guidance_on_Threat_Impact_Scoring_Revised.pdf)
- IUCN Standards and Petitions Committee. 2019. Guidelines for Using the IUCN Red List Categories and Criteria. Version 14. Prepared by the Standards and Petitions Committee.
- Jeffrey, C. (1980). Anacardiaceae. In: Townsend, C. C. & Guest, E. (eds.), Flora of Iraq, Vol. 4, pp. 486-499. Ministry of Agricultural and Agrarian Reform, Baghdad, Iraq.

- Karamanoğlu, K. 1977. Farmasötik Botanik. Ankara Üniversitesi Eczacılık Fakültesi Yayınları, Ankara.
- Kaya, Ö.F., Ertekin, A.S. 2009. Flora of the Protected area at the Tek Tek mountains (Şanlıurfa-Turkey). *Ot Sistematik Botanik Dergisi*, 16(2): 79-96.
- Kaya, Ö.F. 2014. Phytosociological analysis on the National park of the Tek Tek mountains, (Şanlıurfa, Turkey). *Bangladesh Journal of Botany*, 43(1): 27-35.
- Open Standarts for the Practice of Conservation Version 4.0, 2020. Retrieved from <http://conservationstandards.org/wp-content/uploads/sites/3/2020/12/CMP-Open-Standards-for-the-Practice-of-Conservation-v4.0-English.pdf>
- Özcan, M. 2004. Characteristics of fruit and oil of terebinth (*Pistacia terebinthus* L) growing wild in Turkey. *Journal of the Science of Food and Agriculture*, 84:517-520.
- Simpson, M.G., 2019. *Plant Systematics* (3rd edition). Elsevier Academic Press, 761 p.
- Tanker, N., Koyuncu, M., Coşkun, M. 2007. Farmasötik Botanik. Ankara Üniversitesi Eczacılık Fakültesi Yayınları, Ankara.
- Yaltırık, F. 1967. *Pistacia* L. In: Davis P.H. (ed.), *Flora of Turkey and the East Aegean Islands* (Vol. 2). Edinburgh University Press, pp. 544-548.
- Yi, T. Wen, J., Golan-Goldhirsh A., Parfitt, D.E. 2008. Phylogenetics and Reticulate Evolution in *Pistacia* (Anacardiaceae). *American Journal of Botany*, 95(2): 241-251.
- Zohary, M. 1952. A Morphological study of the genus *Pistacia*, *Palaestine Journal of Botany*, Jerusalem Series, 5(1):187-228.
- Zohary, M. 1987. *Pistacia* L. In: *Flora Palaestina* (Vol. 2). Publications of the Israel Academy of Science and Humanities, Juraselam, pp. 296-300.
- Zohary, D. 2000. The Taxonomic ranking of *Pistacia terebinthus* and *P. palaestina*. *FAO-CIHEAM-Nucis- Newsletter* (Information Bulletin of the Research Network on Nuts), 9: 39-40.
- <http://www.mobot.org/MOBOT/research/APweb/>
- <http://www.plantsoftheworldonline.org>
- <https://bizimbitkiler.org.tr/>
- <https://earth.google.com/web/>
- <https://www.resmigazete.gov.tr/eskiler/2007/06/20070621-1.htm>
- <https://www.mevzuat.gov.tr/MevzuatMetin/1.5.2872.pdf>