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Companion species of eastern mediterranean forests



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Structure

Introduction

Characteristics of companion species

Types of companion species

Trees:

Acer obtusifolium

Arbutus andrachne

Cercis siliquastrum

Cupressus sempervirens

Laurus nobilis

Olea europaea

Pistacia terebinthus

Quercus coccifera subsp. *calliprinos*

Styrax officinalis

Shrubs:

Calicotome villosa

Cistus species

Juniperus species

Nerium oleander

Pistacia lentiscus

Introduction

The Mediterranean landscapes have become poorer on species due to their extensive grazing over the years [1].

In 2008, there were 1950 different plant species in Northern Cyprus, with the shrubs playing a very important role in the vegetation [2].

This chapter focuses on the companion species such as trees and shrubs, which grow mainly in the eastern Mediterranean forests and in parts of Cyprus. These plant species can survive in the places where forests were destroyed by humans and natural influences, e.g. forest fires, extensive grazing and massive clear cutting in the forests [3].

The consequence is the emergence of macchia [3]. For the vegetation of Northern Cyprus, the shrubs are very important because they mainly form macchia and phrygana.

The undergrowth of oak population often consists of smaller shrubs such as *Cistus* species, *Calicotome villosa* and *Pistacia lentiscus* [3].

In southern Mediterranean, the population density of oak decreases and more plants can survive for undergrowth [3].

Characteristics of companion species

From May to October the season is dry in Cyprus.

This subtropical climate is the reason why plants are adapted to the dry period [3]. Shrubs and trees of the undergrowth have small leaves which can be several years old. Most of the companion species have hard-leaved, leathery, and mostly evergreen leaves covered with a thick cuticular layer [3]. The stomata are sunken and protect them from transpiration [3].

Types of companion species

Cupressus sempervirens L. – Mediterranean Cypress

Cupressaceae

It's a medium-sized evergreen tree, which reaches a height up to 35 meters. This conifer is monoecious, meaning the plant has both male and female flowers. After pollination the ripe seeds are brown. The blossoming period is from January to April [1].



Cupressus sempervirens [2].



Branch with seed cones of *Cupressus sempervirens* [3].



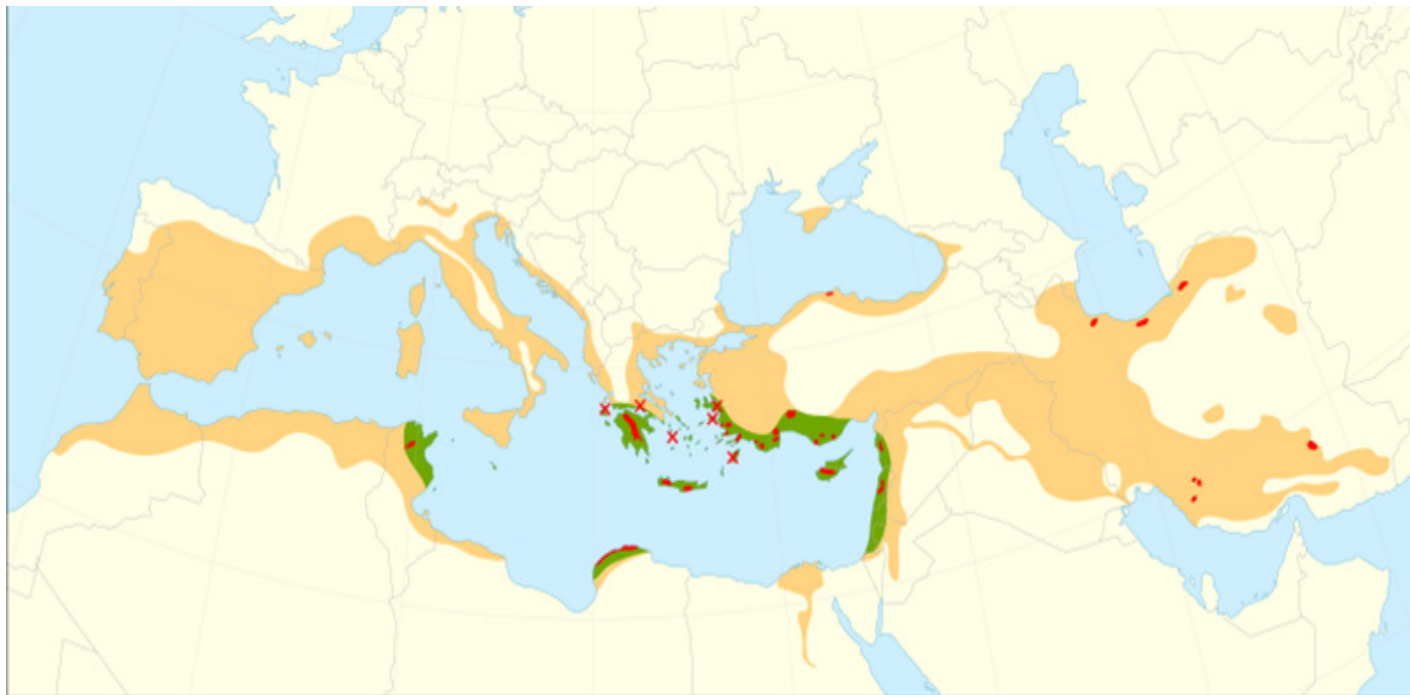
Male cones of *Cupressus sempervirens* [4].

Types of companion species

Cupressus sempervirens L. – Mediterranean Cypress

Cupressaceae

The Mediterranean cypress is considered a pioneer species, which is very adaptable and drought resistant [1].



The Distribution map of *Cupressus sempervirens* shows the current native stands (red), the probable natural range (orange), and the cultivated range (green) [5].

Types of companion species

Olea europaea L. – Olive

Oleaceae

It's an evergreen tree, commonly known as olive tree and is grow as a wild plant in forest and macchia. This species can reach a height of 15 meters with a green upper side of leaf and a silvery underside of the leaf [1].

After two years the leaves fall from the tree [4]. The olive tree can survive for several hundred years and prefers mild winter with temperatures above 0°C and warm summers [4]. The yellowish white flowers have a blossoming period from April to June [1].

The green or black fruits mature from October to December and in the following two months they can be harvested [1, 4]. Due to the high oil content, the fruits are used to produce olive oil or edible olives [4].



Olea europaea [6].

Types of companion species

Quercus coccifera subsp. *calliprinos* (Webb) Holmboe – Palestine oak

Fagaceae

It is an evergreen tree with a height up to 20 meters [1]. The species prefers to grow in macchia and sparse forests [6]. The fruits of the Palestine oak and *Quercus coccifera* look very similar, but the leaves of *Quercus coccifera* are more serrated.



Fruits and Leaves of *Quercus coccifera* subsp. *calliprinos* [7].



Leaves of *Quercus coccifera* [8].

Types of companion species

***Quercus coccifera* subsp. *calliprinos* (Webb) Holmboe – Palestine oak**

Fagaceae

The big difference between *Quercus coccifera* and its subspecies *Quercus calliprinos* is the height of the plant. The Palestine oak grows much higher than the kermes oak.



Quercus coccifera subsp. *calliprinos* [9].



Quercus coccifera [10].

Types of companion species

Arbutus andrachne L. – Greek strawberry tree

Ericaceae

Arbutus andrachne is an evergreen shrub or a small tree (3-5 meters) [1]. The Greek strawberry tree has winding branches with white flowers which blooms from February to April [5]. The smooth bark peels off in large pieces or in curly stripes [5]. *Arbutus andrachne* grows in macchia and evergreen forests in Greece and the Orient [1].



Blossoms of *Arbutus andrachne* [11]. Bark of *Arbutus andrachne* [12].

Types of companion species

Cercis siliquastrum L. – Judas tree

Fabaceae

The name Judas tree is associated with a legend about Judas' death because Judas hanged himself from this tree [1].

The characteristic of this species is the growth of pink flowers on older branches. During the blossoming period, which is between March and April, only the leaves are formed [1]. It grows wild in riparian forests, in macchia and on rocky slopes. Its natural range is in southwestern Europe [1].



1 cm

Fruits and seeds of *Cercis siliquastrum* [15].



Cercis siliquastrum [13].



Flowers of *Cercis siliquastrum* [14].

Types of companion species

Juniperus species – Juniper species

Cupressaceae

Many *Juniperus* species grow in the Mediterranean region. Most of them are small trees and shrubs with brown berry-like seed cones [1, 2]. The four species which are native to Turkey are *Juniperus drupacea*, *Juniperus oxycedrus* and *Juniperus phoenicea* [2]. The last species grows on Pentadactylos, in Karpaz Peninsula, in Cape Greco, and on Akamas of Cyprus [3].



Juniperus drupacea [16].



Juniperus oxycedrus [17].



Juniperus phoenicea is very common in the macchia of Cyprus [18].

Types of companion species

Laurus nobilis L. – Laurel

Lauraceae

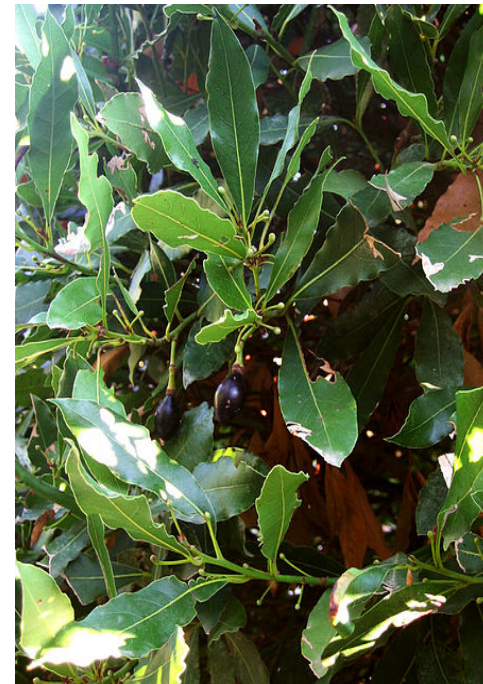
Laurus nobilis is also an evergreen shrub or tree reaching a high of 10 meters [1]. Its leaves are leathery, dark green, slightly serrated and have a spicy aroma because they consist of 1-3 % of essential oils [1, 4]. The plant is mainly grown for spice production and comes from the Mediterranean region [4]. Due to the Gulf Stream, the *Laurus nobilis* can also grow in southern Ireland [4]. Usually, the plant prefers a shady humid forest near the coast [1].



Laurus nobilis [19].



Blossoms of *L. nobilis* [20].



L. nobilis, Leaves and fruits [21].

Types of companion species

Pistacia terebinthus L. – Turpentine tree

Anacardiaceae

It forms a small deciduous shrub or tree. The blossoming period is from April to July. The edible fruits change the color from red to brown [1]. In addition to the use of fruits as food, the plant is used for the extraction of turpentine [5]. The species is native to Iran and the Mediterranean regions [1].



Leaves and fruits of *Pistacia terebinthus* [22]. Fruits of *Pistacia terebinthus* [23].

Types of companion species

Pistacia lentiscus L. – Lentisk

Anacardiaceae

It's an evergreen shrub or small tree which reach a height up to 5 meters (blossoming period March to July). At first its drupe is red and later the fruit turns black [1].

Since ancient times the species was cultivated to harvest its resin for medical or technical purposes. Therefore, the tree bark must be scratched. Furthermore, the resin is added to wine and mouthwash [4].



Pistacia lentiscus [24].

Types of companion species

Styrax officinalis L. – Storax

Styracaceae

The blossoming period of *Styrax officinalis* is from April to May. The gray-green felted leaves have stare-like hairs on the bottom. The species prefers to grow in shrubberies, in sparse forests and on the banks of rivers and is native to Greece, Turkey, Israel, Syria and Jordan, naturalized in Italy, France and Spain [1].



Fruits of *Styrax officinalis* [25].



Flower of *Styrax officinalis* [26].

Types of companion species

Acer obtusifolium Sm. – Syrian Maple

Sapindaceae

Acer obtusifolium is an evergreen maple. It grows mainly in Turkey, Syria, Lebanon and Cyprus.

In Cyprus, the Syrian Maple is found in the Mountains of Troodos and of the Beşparmak, specially in the mountains near St. Hilarion castle and nearby the Pentadaktylos [2].



Acer obtusifolium [27].

Types of companion species

Calicotome villosa (Poir.) Link – Spiny broom

Fabaceae

Calicotome villosa is a thorny shrub (height 0,3-5 meters) with hairy branches and leaves. Its blossoming period is from January to July with yellow flowers. It prefers to grow in maquis and forests [1]. *Calicotome spinosa* looks similar, but the difference is the density of the hair and the thorns. It is native in the western Mediterranean region.



Blossoms of *Calicotome villosa* [28].

Types of companion species

Cistus species

Cistaceae

Very often the maquis and garrigues of the Mediterranean region consist of different types of *Cistus*. In Northern Cyprus, three *Cistus* species are growing: *Cistus creticus*, *C. monspeliensis* and *C. praviflorus* are in flower during spring time from April to July [1].



Flower of *Cistus monspeliensis* [29].



Flower of *Cistus praviflorus* [30].

Types of companion species

Nerium oleander L. – Oleander

Apocynaceae

Nerium oleander is a species of the family Apocynaceae.

The blossoming period of this evergreen shrub with brown fruits is in summer from July to September [1].

Nerium oleander is a poisonous plant which consists of glycosides. This species grows on the bank of rivers, in dry streams and on stony soil [1].



Nerium oleander 31].

Types of companion species

Rhamnus alaternus L. – Italian buckthorn

Rhamnaceae

It is a shrub or little tree with a height up to 5 meters and dark green leaves on the top and light green on the bottom [1, 4]. Italian buckthorn has leaves with a smooth or a serrated edge. The plant is mainly used as an ornamental shrub which has a blossoming period from March to April. Its natural distribution is in macchia and forests of the Mediterranean region [1].



Rhamnus alaternus [32].



Leaves and fruits of *Rhamnus alaternus* [33].

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