

#### WHAT IS AN ENDEMIC SPECIES?

Endemic is defined as species that are local, rare and very rare, and whose areas belong to a certain country or region. It comes from the Latin word endemos (indigenous) and is used in the sense of "native".

Endemic areas can be an island, a peninsula or a mountain, as well as areas of a few square meters. Turkey is one of the important countries in the world in terms of endemic plants. Turkey has 9 thousand plant species, 3 thousand of which are endemic.

According to the data on the website of the Ministry of Culture and Tourism, Turkey has a plant diversity that is rarely seen in the world due to its being a natural bridge between three continents, its various geographical features and the climate diversity brought about by the geographical differences.

One of the most important reasons for Turkey's plant richness is thought to be that Anatolia was a shelter for plants during the ice ages. Turkey is located at the intersection of the Mediterranean Plant Area (Mediterranean and Aegean regions), the European-Siberian Plant Area (Black Sea and Marmara regions) and the Irano-Turan Plant Area (Central Anatolia and Eastern Anatolia regions).

Turkey is among the important regions of the world in terms of endemic plants that grow only in a certain region or are native to a certain region. While there are a total of 2,750 endemic plants in other countries in Europe, this number exceeds 3,000 in Turkey. Apart from Turkey, Greece, the country with the most endemic plants in Europe, has 800 endemic plants. There is only 1 endemic plant species found in Switzerland. Among the provinces with the most endemic plants in Turkey, Antalya with 578 endemic plants, Konya with 478 species and İçel with 366 species are in the top three places.

Some of the most important endemic species in our country are; The Kazdağı fir (Abies equi-trojani) forming a forest on Kaz Mountain, the Kasnak oak (Quercus vulcanica) in the south of Eğridir, the Sweetgum tree or Oriental tree and forests (Liquidambar orientalis) common between Köyceğiz and Dalaman, the King fern (Osmunda regalis) in the Beşparmak Mountains (Aegean part) and the Datça date palm (Phoneix theophrasti) found on the Datça peninsula.

#### DANGERS AWAITING ENDEMIC SPECIES

Today, as a result of the unconscious use of nature by humans for their own purposes, intense pressure is being exerted on living beings and their habitats. Endemic species growing in Turkey are faced with various dangers in nature, such as overgrazing, fire, unconscious cutting, uprooting, reclamation works, construction, urbanization and herbicide use.

The resulting negative factors have led to the need to determine the status of species and take the necessary precautions. In order to help with this need, the "International Union for Conservation of Nature and Natural Resources (IUCN)" was established. This organization determined the danger classes with the studies it conducted and evaluated the species in critical condition and created the work called "Red Data Book". After these studies, a red bulletin called "Rare and Endemic Plants of Turkey" was prepared based on the same categories.

# **SPECIFIC TO MUĞLA**

A total of 2,123 vascular plant taxa have been identified in Muğla province, 380 of which are endemic and the endemism rate is 18%. When the taxa in the area are evaluated according to IUCN threat categories, 1679 are in NE, 166 in LC, 66 in VU, 49 in EN, 99 in NT, 62 in CR, and 2 in DD.

37 mammal species living in Muğla province have been identified. 35 of them were found and recorded during field studies. Of the identified species, 4 are in NT, 2 in VU, and 31 in LC categories according to IUCN.

When bird species in Muğla province are examined in terms of taxa with protection priority, 2 of 274 species are in the EN, 6 in VU, 13 in NT and 253 in LC category according to IUCN criteria. None of these species are endemic. 38 inland water fish species reported to be distributed within the borders of Muğla province have been identified, 11 of these species are marine origin, 6 are endemic in the Muğla region and 7 species are noted as exotic or invasive species.

When the inland water fish species identified are evaluated according to IUCN criteria, 1 species is in the CR, 2 species are in the DD, 25 species are in the LC, 7 species are in the NE, 1 species is in the NT and 2 species are in the VU category.



It has been determined that 37 reptile species and 12 amphibian species live within the borders of Muğla province, and two reptile species (Tracemys scripta elegans, Tracemys scripta scripta) have been detected for the first time in Muğla province.

Products such as Anatolian Sage, Laurel, Thyme, Salep, Lavender and Gum contribute to the provincial economy in Muğla, which has 12 percent of the endemic plant population in Turkey.

#### FLORA SPECIES IN MUĞLA

The most important Turkish endemic species are: the sweet gum tree (*Liquidambar orientalis*), only along the coastline of Muğla and around the Çine River; sage plant (*Salvia officinalis*) on the coastal rocks from Muğla to İzmir; snapdragon (*Leonurus cardiaca*) on the coasts of Muğla and Aydın; and bellflower (*Campanula fruticulosa*) in Kuşadası and Ortaklar and its vicinity. Also, the thorny wild daisy (*Bellis peremnis*) is seen on the coasts of Aydın, in Ödemiş and the central Taurus Mountains; foxglove (*Digitalis sp.*) on the coastline of Muğla and İzmir; and St. John's Wort (*Centaurea sp.*) in the Sandras Mountains of Muğla. The Sandras Mountains near Köyceğiz are home to many endemic species and the region should be protected to preserve this wealth.

Other endemic species in Muğla are red pine, black pine, Mediterranean cypress, kermes oak, gray holm oak, holm oak, dwarf juniper, strawberry tree, wild olive, rosary, laurel, carob, sumac, terebinth and sandalwood. Shrub and herb species include oleander, rockrose, fern, astragalus, heather, chaste tree, fennel and thyme.

# Acantholimon Koeycegizicum (Koycegiz snow thorn) (CR)



Alkanna Mughlae (CR)



Centaurea kirmacii (CR)



Colchicum figlalii (CR)



Crocus babadaghensis (CR)



**ENDEMIC SPECIES HANDBOOK (EK 014)** 



Fritillaria milasense (CR)



Muscari elmasii (CR )



Pinguicula habilii (CR)



Scorzonera argyria





# Onopordum caricum ( Delikenker )



Globularia dumulosa



- Cyclamen trochopteranthum (Coots): A type of grass that covers the ground after the snow melts in the spring in the region. It has various local names.
- Campanula fruticulosa (Bell Flower): A plant species that grows in rocky areas in the high regions of the mountains.
- Sternbergia candida (locally called a type of gravel daffodil): A plant with fragrant flowers that grows naturally only in the Fethiye region. It produces male flowers in season. In the southwest of the Taurus Mountains, Sternbergia Candida blooms under the cedar tree (Cedrus libani) in March. It is the only member of the Sternbergia family that produces white flowers.





### ENDEMIC PLANT SPECIES USED IN LANDSCAPE APPLICATIONS IN OUR HOTEL

During the construction of the landscape of PARKIM AYAZ HOTEL, efforts were made not to damage the existing vegetation. Endemic species such as Sweetgum, Citrus, Olive, Pomegranate, Pine, Fig, Laurel and Mulberry trees are spread throughout the area. It is also possible to see endemic species such as Acanthus, Thyme, Sage, Gum etc. in the hotel.

**Paspalum grass** type was used in the grassing in the general areas of PARKIM AYAZ HOTEL. Paspalum Grass is known for its resistance to salinity. It is one of the biggest reasons for preference that it can be irrigated with ocean, sea water and wastewater. Since it is possible to use sea water by diluting it, it is the most preferred grass type in the Aegean and Mediterranean regions. The grass is short, provides a thick grass cover even in barren and sandy soils, and is resistant to drought.

At the same time, this type of ready grass is soft and shiny. The garden applications we have done at PARKIM AYAZ HOTEL have been transferred to IRRIGATION SYSTEMS INSTRUCTIONS (Doc.No.: TK TL 009).

Muğla is a monumental tree paradise with 82 registered trees. Examples of these trees are plane tree (Platanus orientalis), andiz tree, black pine (Pinus nigra), elm (Ulmus sp.), black poplar (Populus nigra), oak (Quercus), sweet gum tree (Liquidambar orientalis), palm, juniper tree, eucalyptus, carob (Ceratonia siliqua), acacia tree, mulberry tree (Morus nigra) and mastic tree (Pisticia lentiscus). However, most of the trees that are protected are plane trees. The most prominent of these is the 700-year-old black pine in Köyceğiz Sandras Mountains, as well as the 6-meter diameter plane tree in Pınarbaşı – Bozöyük and other similar examples in Bayır Village of Marmaris. There are no monumental trees in PARKIM AYAZ HOTEL.

# **MAMMAL SPECIES (Not Endemic Species)**

# Caracal caracal (LG)



# Lutra lutra (Otter) (NT)



Ursus arctos (The brown bear)( LC )





# MUĞLA İLİNDE MEMELİ TÜRLER ÜZERİNDEKİ TEDHİTLER

Types	Threats
Canis aureus	Poaching + poisoned meat
Canis lupus	Poaching + poisoned meat
Caracal caracal	Poaching + poisoned meat
Capra aegagrus	Poaching
Hystrix indica	Pesticides + poaching + habitat destruction
Vormela peregusna	Pesticides + poaching + habitat destruction
Felis silvestris	Interbreeding with domestic cats + habitat
	destruction
Lutra lutra	Wetland pollution + poaching
Ursus arctos	Poaching + conflict with honey producers

**BIRD SPECIES (Not Endemic Species)** 

Oxyura leucocephala (EN )



Pelecanus crispus (CR)



Streptopelia turtur (VU)



İÇ SU BALIK / ÇİFTYAŞAR TÜRLERİ
Ladigesocypris irideus (NT)





# Lyciasalamandra fazilae subs. fazilae ( EN )





Lyciasalamandra luschani subs. luschani (VU)



Carcharhinus plumbeus (Sandbar shark) (VU )( Not Endemic)





Important Nature and Conservation Areas in Muğla

National Parks: Marmaris, Saklıkent

Nature Parks: Bafa Lake, Ölüdeniz

Natural Protected Areas: Sırtlan mountain, Kartal lake

Special Environmental Protection Areas: Datça Bozburun, Gökova, Köyceğiz Dalyan, Fethiye

Göcek , Patara

Wildlife Development Areas: Muğla Yılanlı, Muğla Köyceğiz

## IMPORTANT AREAS IN TERMS OF PLANT COMMUNITIES IN MUGLA

#### 1. Çal Mountain - Tuzla Beli

Çaldağı (2185 m), which presents one of the best examples of high mountain vegetation character of Muğla province, has a character of steep scree areas among the low altitudes of the nearby region, rocky areas with high slope degree, *Pinus nigra* (Black Pine) dominant in the east and north in the lower parts and *Pinus brutia* (Red Pine) dominant in the south and west. Towards the upper parts of the mountain, *Muscari elmasii* (Diamond Hyacinth) has a very important place. In addition, *Scorzonera sandrasica, Teucrium sandrasicum, Teucrium alyssifolium, Clinopodium troodi* ssp. *vardaranum, Noccaea leblebicii, Verbascum dalamanicum, Cephalaria lycica, Globularia dumulosa, Erigeron cilicicus* and *Echinops emiliae* species, which are endemic to our country and in the high-threat category according to IUCN criteria, support the special plant community character of the region.

#### 2. Babadağ

Babadağ Special Plant Community area, which contains one of the best examples of gradual vegetation rise starting from sea level in Muğla province, is an area that shows different characteristics in plant species diversification in north and south aspects starting from the lower slopes where forest and rock vegetation structures are dominant. Floristic richness of the area starts in the direction of Faralya, Kelebekler Valley, Belceğiz Gulf, Uzunyurt, Karaağaç route located in the southern part. Sudden change of topography affects the triggering of the regional floristic structure with the effect of climate characteristics and supports the endemism character of Babadağ Special Plant Community.

#### 3. Boncuk - Gavurdöndü Mountains

Muğla province is the Boncuk-Gavurdöngü Mountains Specific Plant Community area, which contains one of the best examples of rapid topographic transition to high areas in the region. Among the remarkable species identified in the area are *Ophrys bombyliflora, Dianthus elegans, Papaver pilosum, Arabis ionocalyx, Euphorbia kotschyana, Iris unguicularis, Silene cryptoneura, Muscari racemosum, Dianthus elegans, Galium murale, Sideritis albiflora, Limodorum abortivum, Ophrys mammosa, Serapias bergonii and Serapias politisii.* 

#### 4. Karadere – Leteon – Patara

The Patara Sand Dune Region, located at the intersection of Antalya and Muğla provincial borders, is located within the Muğla provincial borders, in the west of Eşen Stream. The region, which is the longest and widest sand dune area in the nearby geography, has been evaluated within the Special Plant Communities, especially with the plant species spreading within the sand dune vegetation character and the structure forming seasonal wetlands. The dominant species observed in the region include Helichrysum stoechas, Gagea graeca, Ranunculus bullatus, Campanula lyrata, Orchis anatolica, Arabis alpina, Muscari macrocarpum, Orchis anatolica, Ophrys lutea, Ophrys holoserica, Serapias politisii, Glebionis segetum, Lathyrus aphaca, Linum bienne, Thymelaea hirsuta, Silybum marianum, Silene colorata, Allium neapolitanum, Papaver gracile, Sedum litoreum, Echium plantagineum, Valantia hispida, Sideritis romana, Umbilicus horizontalis and Trigonella monspeliaca species can be listed.

## 5. Balıkaşıran

The Balıkaşıran Specific Plant Community region, which starts approximately from the administrative borders of the Datça-Marmaris district and extends westward towards the Datça peninsula and is located west of Emecik to include the Gebekum Coastline, is one of the best examples of serpentine areas at sea level in Muğla province. The Pinus brutia (Red Pine) dense forest character of the region is accompanied by maquis and phrygana vegetation characters in most regions due to past destruction.

The Gebekum coastal area, located on the western border of the area, is a very local area with a character that can be considered unique within the nearby geography and requires protection. The region, which is the largest representative of the dune vegetation character in the Datça peninsula, hosts many dune plant species.



#### 6. Kızlan

The Kızlan Specific Plant Community area located in the central part of the Datça Peninsula has been evaluated as a natural area squeezed between the destructed areas in the nearby region. The area, where the Pinus brutia (Red Pine) species dominates in the upper parts, also shows maquis and phrygana vegetation structures mixed with serpentine character in the lower parts.

## 7. Datça

Among the most prominent species of the region, Juniperus phoenicea, Microsciadium minutum, which is quite rare in our country, Linum arboreum with shrub form, Onopordum caricum, which is a local species, four of our rare species that are found in one or two places in our country, Teucrium microphyllum (Knidos Ancient City) and Tordylium hirtocarpum (Datça), Achillea cretica (Datça Peninsula) and Centaurium serpentinicola (Datça Peninsula) can be given as examples. In addition, Ophrys omegaifera ssp. basilissa, known from the Aegean Islands, was found in Datça with the help of literature within the scope of the project and its locations were recorded. Similarly, it is possible to say that Datça Special Plant Society has a rich structure in terms of natural orchid species that are under intense destruction in our country. Among the natural orchid species identified in the field studies, examples include Himantoglossum robertianum, Ophrys argolica, Ophrys iricolor, Ophrys lutea, Ophrys sitiaca and Ophrys speculum.

### 8. Yılanlı

Forest, steppe and maquis vegetation are seen on Yılanlı Mountain and the altitude reaches up to 1670 meters above sea level. In the forest vegetation, Pinus brutia var. brutia (red pine) is dominant in the areas where the altitude is low, and with the increase of the altitude Pinus nigra subsp. pallasiana (black pine), Cedrus libani var. libani (cedar, tar tree), Cupressus sempervirens (cypress) trees are seen. Steppe vegetation is seen in the area when the altitude exceeds 1000 meters. The species that dominate the steppe vegetation are Phlomis linearis, Asyneuma linifolium subsp. linifolium, Acantholimon puberulum, Minuartia anatolica, Astragalus condensatus, Scorzonera argyria, Marrubium globosum subsp. globosum and Thymus argaeus.

## 9. Menteşe-Kıran Köyü Çevresi

The village is surrounded by dense red pine forests, while there are also agricultural areas in some areas. In the south of the village, new records for Muğla province are CR category Campanula aktascii, VU category Nepeta phylloclamys and Allium sandrasicum, and in the east of the village, Crocus muglaensis species live. This region consists of red pine forest, maquis vegetation and rocky

areas. The forest vegetation is mainly covered with red pine trees. Muğla endemic Crocus muglaensis is distributed under red pine forests. In forest clearings, Romulea tempskyana and endemic Crocus fleischeri from bulbous plants exhibit quite healthy populations in February-March.

## 10. Akbük- Karaburun ve Güvercinlik Sırtlandağı Halep Çamı Ormanı

It forms a pure or mixed forest with red pine in the Güvercinlik region between Milas and Bodrum. This area is also the Sırtlandağı Aleppo Pine Nature Protection Area (TKA).

## 11. Sandras Dağı

Allium sandrasicum, (Sandras körmeni), Ferulago sandrasica (Lamb coriander), Scorzonera sandrasica (Mountain buckthorn), Senecio sandrasicus (Rich ragweed), Ornithogalum sandrasicum (Somsasal, Sandras white star), Genista sandrasica (Pine drab), Teucrium sandrasicum (Ülper), Viola sandrasea (Sandras violet), Muscari sandrasicum (Gökboncuk) species were introduced to the scientific world from here, the first samples of which were collected from Sandras Mountain, took their scientific name from the mountain and can be shown as examples of plant species specific to the region. In addition, it is possible to state that the region, which hosts species such as Colchicum figlalii, Cytisus gueneri, Polygonum karacae, Lamium sandrasicum, Scorzonera ahmet-duranii, Barbarea duralii and Micromeria aybalae, which are endemic to Sandras Mountain and the surrounding region, is the richest endemism focus of the province when the floristic composition of Muğla is considered as a whole.

#### WILDLIFE AREAS IN MUGLA

#### 1. ŞAT DELTASI

Şat Delta (Çalış Beach Bird Paradise); It is seen as an important featured area in terms of the birds it hosts, despite its very small surface area being dominated by Fethiye city center. The featured wild animals it hosts are; Gallinula chloropus (Bern-III), Phalacrocorax carbo (Bern-III), Mareca strepera (Bern-III), Thalasseus sandvicensis (Bern-III), Ardea alba (Bern-III), Anas crecca (Bern-III), Ardea cinerea (Bern-III), Alcedo atthis (Bern-III), Serinus serinus (BernIII), Corvus corone Phylloscopus collybita (Bern-III), Phoenicurus ochruros (Bern-III), Erithacus rubecula (Bern-III).

#### 2. METRUK TUZLA

Metruk Tuzla and its surroundings are seen as a special area in terms of birds due to the high population of Pelecanus crispus (Dubrous Pelican) and Phoenicopterus roseus (Flamingo). Metruk Tuzla Wetland; Upon the proposal of the National Wetlands Commission, it was registered as a Wetland of National Importance by the Ministry on 31/07/2019. The special wild animals it shelters are; *Phoenicurus ochruros (BernII), Buteo buteo (Bern-III), Phoenicopterus roseus (Bern-II), Phoenicopterus roseus (Bern-II), Egretta garzetta (Bern-II), Spatula clypeata (Bern-III), Ardea alba (Bern-II), Pelecanus crispus (Bern-II), (NT), Phoenicopterus roseus (Bern-II), Microcarbo pygmaeus (Bern-II), Tringa ochropus (Bern-II).* 

## 3. GÜLLÜK

Güllük Bay and its surroundings are considered as a special area in terms of birds due to the high population of *Pelecanus crispus* (*Dubrous Pelican*) and *Phoenicopterus roseus* (*Flamingo*). The special wild animals it hosts are; *Phalacrocorax carbo* (*Bern III*), *Pelecanus crispus* (*Bern II*) (*NT*), *Alcedo atthis* (*Bern II*), *Phoenicopterus roseus* (*Bern II*), *Rallus aquaticus* (*Bern III*).

## 4. GÖKÇEOVACIK BATISI



Lyciasalamandra fazilae (Başoğlu & Atatür, 1974) is a "Narrowly Distributed Endemic" species. The area called Gökçeovacık West, which provides habitat for this species, has been proposed as a special wild animal area.

# 5. ÇİLEKLİ – ARMUTÇUK AND ITS SURROUNDINGS

Lyciasalamandra flavimembris (Mutz & Steinfartz, 1995) is a "Narrowly Distributed Endemic" species. The area called "Çiçek-Armutçuk and its Surroundings", which forms the habitat for this species, has been proposed as a special wild animal area.

## 6. YENİKÖY – ORTAKÖY SOUTH

Lyciasalamandra flavimembris (Mutz & Steinfartz, 1995) is a "Narrowly Distributed Endemic" species. The area called Yeniköy-Ortaköy South, which provides habitat for this species, has been proposed as a special wild animal area.

#### 7. DODURGA NORTH

The featured wild animal area called Dodurga North was selected as a featured area because it is within the distribution area of the "luschani" subspecies of the Lyciasalamandra luschani (Steindachner, 1891) species.

#### 8. BETWEEN ARPACIK - ÖREN - KINIK

The area is very important in terms of the wild mammals it hosts. The north of Kınık and Bekçiler localities of Seydikemer may be the area where the caracal (*Caracal caracal*) and lynx (*Lynx lynx*) species share the same habitat. The specific wild animal area between Arpacık-Ören-Kınık is also important in terms of inland fish. The species Salmo trutta macrostigma is an endangered species that lives only in the mountainous and high-flow areas of the Eşen Stream between Ören-Seki in Muğla. The species lives in the very deep rocky canyon region of approximately 15-20 km between Ören-Seki. The specific wild animals it hosts are; *Caracal caracal* (Cites I) It was determined as tta macrostigma.

#### 9. BALIKLI STREAM

Although the endemic fish species *Ladigesocypris irideus* and *Salmo trutta macrostigma* are found in the region between Ören and Seki, *Ladigesocypris irideus* is distributed in small and large water resources (Tersakan Stream, Dalaman Stream, Köyceğiz Lake, Yuvarlak Stream, Namnam Stream, Balıklı Stream, Akçapınar Stream, Çetibeli Stream and Hisarönü Stream) in the Dalaman-Marmaris region. Action plans should be put forward for the very sensitive protection of small-scale

water resources where *Ladigesocypris irideus*, a very sensitive and fragile species, whose biological and ecological importance is not well known by the local people, lives.

## 10. AKÇAPINAR STREAM

The specific wild animals it hosts are determined as Salaria fluviatilis, Gambusia holbrooki, Liza aurata, Squalius fellowesii (Endemic), Ladigesocypris irideus (Endemic) (NT), Anguilla anguilla (CR) (Cites II), Salmo trutta macrostigma.

#### 11. KARAOT WETLAND

Karaot Wetland is located in Yanıklar, Fethiye and is one of the most important areas for waterfowl. In addition to waterfowl, it is also home to daytime predators such as *Circus aeruginosus* (Reed Harrier); nocturnal species such as Tyto alba (Barn Owl) and Strix aluco (Tawny Owl). The specific wild animals it hosts are; Tachymarptis melba (Bern II), Tyto alba (Bern II) (Cites II), Strix aluco (Bern II) (Cites II), Merops apiaster (Bern II), Circus aeruginosus.

#### 12. YANIKLAR – KARGI SOUTH

In addition to having a rich biological diversity in its surroundings, there is an endemic sweetgum forest by the sea, a lagoon within the sensitive B zone area, a wetland where birds stay and a canyon on the Kargi stream.

#### **SOURCE**

 $\frac{\text{https://bolge4.tarimorman.gov.tr/Documents/MU%C4%9ELA%20%C4%B0L%C4%B0%20B}}{\text{%C4\%B0YOLOJ\%C4\%B0K\%20\%C3\%87E\%C5\%9E\%C4\%B0TL\%C4\%B0L\%C4\%B0K\%20ENVANTER%20VE}}$  %20%C4%B0ZLEME%20PROJES%C4%B0.pdf

https://www.tursab.org.tr/dosya/7047/02-muglatrrev04-bk 7047 5944587.pdf

https://www.researchgate.net/profile/Tuelin-Coker/publication/282908871\_Gokova\_Bayabout\_Fishes/links/5621f4b608aea35f2681be66/Goekova-Bay-about-Fishes.pdf

https://dergipark.org.tr/tr/download/article-file/966710

https://www.ftso.org.tr/assets/upload/dosyalar/r053x-kargi-ve-yaniklar.pdf