Tamarix - tamarisks in Europe: distribution, habitat, usage and threats

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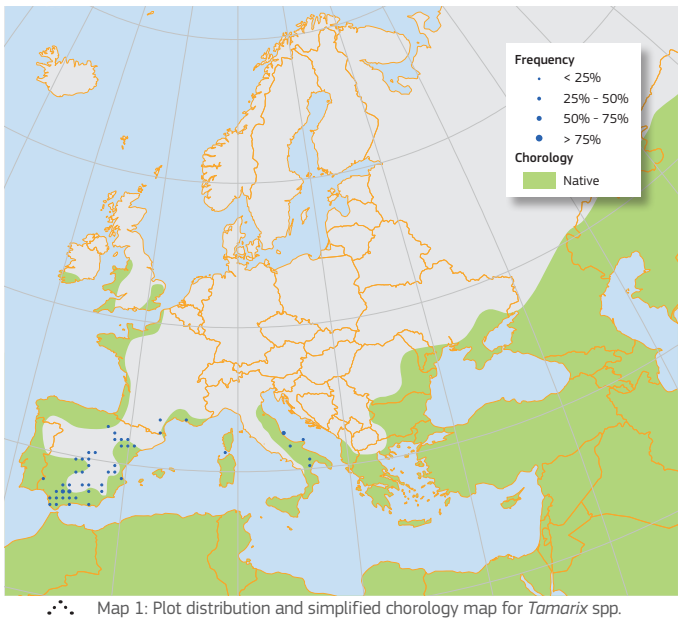
Tamarisks, or salt cedars, belong to a large group of shrubby and flowering species of the genus *Tamarix*. Fourteen species are counted in Europe, concentrated principally in the Mediterranean region and Eastern Europe. They typically are adapted to arid climates thanks to an efficient and deep root system. These species thrive in a wide range of habitats from flooded to drought, but grow best on sandy or gravelly soils, also tolerating saline waters. They are commonly used as ornamental flowering shrubs, but are also planted as marine windbreaks or for the sand dune stabilisation. Some species are considered as invasive plants in many countries for their rapid colonisation and aptitude for expansion.

Tamarisks (*Tamarix* spp.) are shrubs or small deciduous trees, reaching from 4 to 15 m in height. They have a broad and bushy shape with numerous large basal branches and a deep and extensive root system. The leaves are scale-like, 1.5 to 3.5 mm long, with salt-secreting glands[1-3]. Flowering branches are mostly primary or secondary carrying the **inflorescence** arranged in **panicles** of several small flowers, subtended by a small bracts. The **hermaphrodite** flowers are pink or white in colour, with petals that may be persistent or fall soon after blossoming. Tamarisk fruit is a capsule, bearing many tiny seeds less than 0.5 mm in size[3-5].

Distribution

The genus *Tamarix* occurs naturally from Western Europe and the Mediterranean to North Africa, northeastern China, Mongolia, India and Japan[1, 6]. In Europe, 14 species are reported. African tamarisk (*Tamarix africana*), Bové's tamarisk (*Tamarix boveana*), Canary Islands tamarisk (*Tamarix canariensis*), Dalmatian tamarisk (*Tamarix dalmatica*), French tamarisk (*Tamarix gallica*), Hampe's tamarisk (*Tamarix hampeana*), small-flower tamarisk (*Tamarix parviflora*), Smyrna tamarisk (*Tamarix smyrnensis*) and four-stamen tamarisk (*Tamarix tetranda*) are native to the Mediterranean area, mainly France, Spain, Portugal, Italy and Greece and Turkey[7, 8]. The species *Tamarix ramosissima, Tamarix laxa, Tamarix hispida, Tamarix gracilis* and *Tamarix meyeri* are native to Eastern Europe, Moldova, Russia and Ukraine[7]. Some species have become naturalised in other countries, especially America, where they were introduced as landscape ornamentals and have escaped cultivation.



Map 1: Plot distribution and simplified chorology map for *Tamarix* spp. Chorology of the native spatial range for *Tamarix* spp., derived after Meusel and Jäger[22].

Habitat and Ecology

Tamarisks can tolerate an extreme range of environmental conditions, from drought to flooding, and highly saline soils. Climatically, tamarisks are best suited to arid and semi-arid zones[9]. These species have specialised roots that can draw water from deep underground, but are also capable of extracting water from unsaturated soil layers (a facultative **phreatophyte**). They tolerate saline water and exude large quantities of salt through their specialised leaves, and can survive prolonged periods of inundation[2, 10, 11]. These species tolerate a wide range of habitat types, but are best adapted to the sandy or gravelly banks of waterways and on sandy floodplains, especially where their roots can access underground water[9]. They grow best in alkaline soils, but also tolerate acidity[12]. These plants are found on non-rocky silt loams and clay loams of high organic matter along streams, bottomlands, pond margins, banks of drainages and washes and other wet environments in arid and semiarid regions[13, 14]. Tamarisks are not shade-tolerant[14].

Trunk of old tamarisk hybrid (*Tamarix gallica* x *canariensis*). (Copyright Santos Cirujano Bracamonte: CC-BY)

Pink flowers of an ornamental French tamarisk (*Tamarix gallica*) in a garden. (Copyright Giovanni Caudullo: CC-BY)

Importance and Usage

Tamarisks are used worldwide as ornamental plants. They are frequently planted as windbreaks or grown for the stabilisation and afforestation of sand dunes[15, 16].

They also have other important properties, being classified as medicinal plants. The **galls** and bark are used as astringent. Many species, such as the French tamarisk, also have tonic, diuretic, stimulant and stomachic action[17]. They are also used for tanning and dyeing purposes[5, 18, 19]. Some tamarisks are **melliferous** and are used as a sugar substitute[5].

Reddish-orange inflorescences of the African tamarisk (*Tamarix africana*). (Copyright Santos Cirujano Bracamonte: CC-BY)

Threats and Diseases

Three species of fungi, *Botryosphaeria tamaricis, Diplodia tamarascina* and *Leptosphaeria tamaricis*, can form cankers and cause branch dieback on tamarisks. The latania scale (*Hemiberlesia lataniae*) and oystershell scales (*Lepidosaphes ulmi*) are two insects which frequently infest these species[20]. Some species, principally salt cedar (*Tamarix ramosissima*) Chinese tamarisk (*Tamarix chinensis*), small-flower tamarisk, French tamarisk and their hybrids, are considered as invasive weeds in the United States, and have been the target of many control programmes since the 1960s[21].

Fluvial vegetation with Canary Islands tamarisk (*Tamarix canariensis*). (Copyright Santos Cirujano Bracamonte: CC-BY)

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Guerrero Maldonado, N., López, M. J., Caudullo, G., 2016. ***Tamarix* - tamarisks in Europe: distribution, habitat, usage and threats**. In: San-Miguel-Ayanz, J., de Rigo, D., Caudullo, G., Houston Durrant, T., Mauri, A. (Eds.), *European Atlas of Forest Tree Species*. Publ. Off. EU, Luxembourg, pp. e011f06+