
OAKS IN SWEDEN

by Lennarth Jonsson

In the Scandinavian languages, the word for "oak" is "ek/eg," which is derived from the ancient Scandinavian "igja," meaning "reverence or respect." From ancient times the oak has had a special position for the people in this remote part of the world. The oldest *Quercus robur* in Sweden today is about 1,000 years old (one in Denmark is about 400 years old) and has a circumference of 13.5m (50 ft). The largest *Q. petraea* has a circumference of 10m (36 ft).

Nowhere else in the world does the genus *Quercus* grow indigenously as far north as in Scandinavia. Keep in mind that the southernmost point of Scandinavia is (latitudinally) the north of Newfoundland. The Hudson Bay has the same latitude as Scandinavia!

In Scandinavia there are two indigenous species: *Q. robur* and *Q. petraea*. The oaks have generally a good plasticity, i.e. they stand variations of daylight, soil, humidity and many other conditions, but they demand light and heat. In warmer periods after the Glacier Epoch, the oaks were much more common in Scandinavia and also grew much farther north. An oak requires a certain length of growing season to mature its acorns. It seems that this is achieved where the average temperature is at least +10°C (50°F) for four months. Consequently, the northern border of *Q. robur* parallels the isotherm along the Norwegian coast up to about 63°N through Sweden between 59° - 61°N and Finland-Karelia up to 61°N.

Although *Q. robur* is one of the more heat-demanding trees in northern Europe, this species is unusually indifferent to varied temperatures. In its northwestern corner (Ireland and Scotland), the July average is about +14°C (58°F) and in January around +8°C (38°F); whereas, in the Russian plains on its eastern border, the corresponding temperatures are +24°C (76°F) and -15°C (3°F), respectively. In Scandinavia these temperatures are between those extremes. Cool summers are common but usually not as cold in winter due to the influence from the Atlantic.

Q. robur is very hardy because it survives along the far northern coasts of Sweden and Finland; that would qualify it for a breeding program with tender and outstanding species. Its hardiness is astonishing because the genus must be of subtropical/tropical origin. [A test in western Java proved that *Q. robur* still has tropical tolerance (1,500 m (5,460 ft) above sea level). It grew as an evergreen without any dormancy (J.A. Romberg, *Meritstems, Growth and Development*, 1963). *Fagus* and *Abies* did not survive.] The tendency of northern species to keep their leaves in winter might be a lasting evergreen quality? The deeply lobed leaves that the deciduous species have are uncommon until recent ages according to C.W. Wang, *The Forest of China*.

Quercus petraea is somewhat more southern in Scandinavia and is not wild in the Stockholm area and Finland. The eastern border of *Q. petraea* in Europe is from East Prussia to Moldavia. It is a suboceanic species and less common in Scandinavia where it grows in poorer and shallower soils than *Q. robur*. However, both species often grow in the same areas because of very variable conditions within a short distance in southern Sweden. Due to this, pure stands of *Q. petraea* are rare.

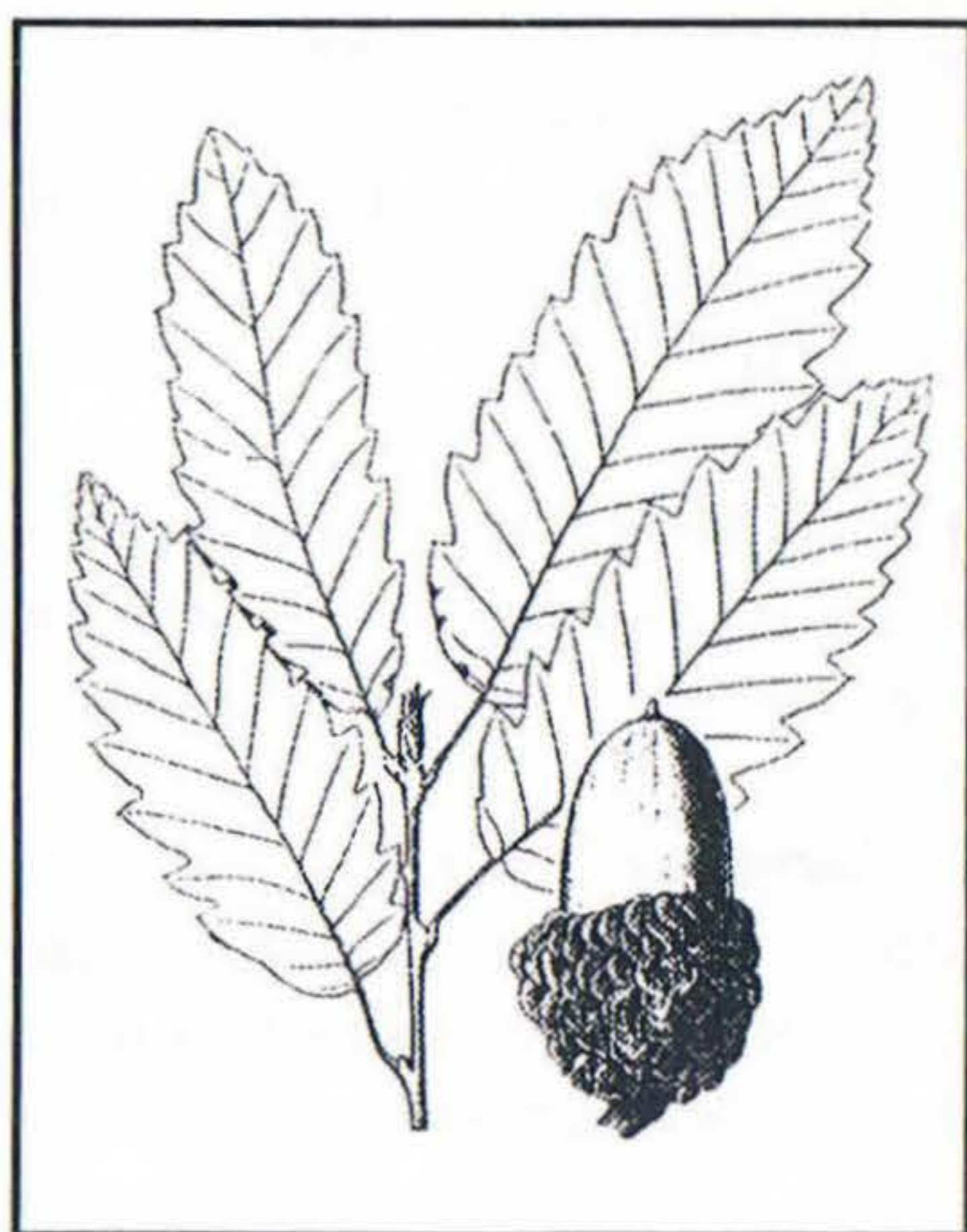
In Sweden several oak species have been grown and may have the potential of being grown. More common exotics grown in southern Sweden are: *Q. castaneifolia*, *Q. cerris*, *Q. coccinea*, *Q. frainetto*, *Q. macranthera*, *Q. palustris* and *Q. rubra*. However, any named clones, as far as I know, have not been planted in Scandinavia, except perhaps in private gardens.

Q. accutissima - Provenances of this species grown in Sweden have proved to be tender and can only be planted in the mildest parts of Scandinavia, in sheltered and well-drained sites having lime soil.

Q. alba - To manage this species in Sweden, only northeastern strains should be tested as they are supposedly best adapted to our conditions. This species will often become a small, slow-growing tree with thick branches. It grows best in southeastern Sweden, along the southernmost coast of the Baltic Sea up to Öland (about 56° 30'N), where the local climate has a more continental character. The reason to grow it in Sweden is for its silver-white bark of older trees and its beautiful autumn colors. It is difficult to establish due to deep roots.

Q. bicolor - Because it needs long, hot summers, it is less suitable in Sweden, though it is a highly attractive tree. Only advisable to try in southeastern Sweden. In both Stockholm and Copenhagen, 15m (50.6ft) specimens are reported. Any fall color can only rarely be seen because it requires warm and fairly dry American autumns.

Q. castaneifolia - This species is native to southeastern Caucasus and northern Iran, where it grows in river valleys and on hillsides together with *Fagus orientalis*. It is a mesophytic species and can stand persistent droughts which are common in southeastern Sweden in April through June. Consequently, it requires well-drained soil. It can be grown in the milder zones in Sweden. In Caucasus it grows to a 50m (182ft) high tree having a diameter up to 1.5m (5.5ft), but the tallest specimen in Scandinavia is a 100 year old tree in the Botanic Garden in Copenhagen. This tree has a circumference of 4.5m (16ft) and is 19m (70ft) high and equally wide. Much taller specimens cannot be expected to grow here.



Quercus castaneifolia (from Dippel: Krüssmann)

Q. cerris - This species of the Balkans and Turkey is resistant to strong winds and is relatively hardy in Sweden if specimens of hardy provenances are planted. In Stockholm the species will grow 15m (55ft) tall and will fruit more often than our native species. *Q. cerris* is relatively mesophytic and often grows on hillsides and in deep sandy soil. In cultivation it is rarely found in lime soils. Small seedlings should be covered in winter as the shoots mature late in the season. Its deep roots make it easier to establish itself than our native species. The wood is less useful and will not become very old, only about 200 years old.

Q. coccifera - Not hardy in Sweden.

Q. coccinea - This species has the best fall color in Sweden, though very late in the season if it is not in a favorable site. It can be planted in our milder zones, but only the hardiest provenances should be used; these are said to be found in Tennessee and North Carolina. A consequent searching for reliably early autumn-coloring clones should be carried through. There is a selection 'Splendens' known for its good color but its hardiness in Sweden is doubtful. The tree tolerates windy conditions very well.

Q. dentata - The experiences from growing this species in Sweden are varied. Most commonly the trees will become small, thin, have several trunks and a gaunt habit. Also freezing of the annual shoots can be common. Only the hardiest provenances should be planted in sunny and sheltered sites. One of the better specimens reported is 3.5m (13ft) tall. Korean collections of other genera have proved to be very successful in Scandinavia and that might be a reason to find Korean provenances even in this case or collect from the sand dunes on the shores of Hokkaido, where it grows together with *Rosa rugosa*. The hybrid with *Q. ponticum*, *Q. x pondium* has proved to have better development than *Q. dentata*.

Q. ellipsoidalis - Very rarely planted but should be hardy at least from provenances of Manitoba.

Q. frainetto - This species from the Balkans is very drought tolerant where it grows in the mountains of Serbia. It grows best in a warm, deep lime soil that is reasonably drained. In milder parts of Sweden it may even grow better than *Q. robur*. Specimens of 25 to 30m (91-109ft) tall are known in southern Sweden (Scania).

Q. gambellii - Nothing is reported on this species in Sweden. Probably only possible in southeastern Sweden where the local climate is on the drier and sunnier side of the rain shadow of the Atlantic winds.

Q. garryana - There is a 100 year old tree about 20m (73ft) high in the Botanic Garden in Copenhagen. Provenances from Vancouver Island, having relatively cool summers, are recommended for Germany; perhaps also they might be suitable for Scandinavia also.

Q. glandulifera - A very attractive oak that is very doubtfully hardy in Scandinavia. Possibly, it may grow only in the mildest zones of Sweden.

Q. hartwissiana - This oak is native to a small strip along the southern and eastern Black Sea where the precipitation is over 100cm (40in). Only a few areas in Scandinavia have that much, at least regularly. In Copenhagen there is a 15m (55ft) tall tree over 100 years old.

Q. ilex - This species is not hardy in Scandinavia, of course.

Q. ilicifolia - This interesting shrub, having an odd branching habit and ornamental leaves, might be tested on sheltered sites in the mildest zones. No experiences of growing this species has been reported in Sweden.

Q. imbricaria - In Germany this species can grow to 20m (73ft) within 40 years and there is a 17m (62ft) high specimen about 70 years old in Charlottenlunds Arboretum in Denmark. It should be possible to grow in the two mildest zones over here.

Q. libani - In the Botanic Garden in Copenhagen, there is a beautiful 6m (22ft) tall specimen. It may be possible to plant in alkaline soil on the most favorable sites in Sweden.

Q. lyrata - If there would be any opportunity to grow this species it should be in southeastern Sweden.

Q. macranthera - In its native area, this species is reported to grow as a dwarf shrub at the altitude of 3,000m (10,920ft). This very ornamental oak was frequently planted early this Century in town parks in southern Sweden. It is a relatively fast grower, and has a beautiful crown, and hardy in Stockholm, where it sometimes has mature acorns.



Quercus macranthera Photo: Archivbild (Krüssmann)

Q. macrocarpa - This attractive species grows in Manitoba, where it is frost free for 100 days and the precipitation is only 37cm (15in). Given this fact, there might be a good opportunity to find provenances suitable for Scandinavia. This species has been very difficult to establish in northern and western Europe. For Scandinavia, collections from Nova Scotia should cope with our climate in southeastern Sweden. In the Botanic Garden in Copenhagen, there is a 100 year old tree 13m (47ft) high and 15m (55ft) wide, which has an irregular habit with large, twisted branches.

Q. marilandica - Due to its interesting leaves, it might be worthwhile to test this species in southernmost Sweden in a dry and sheltered sites with sandy soil.

Q. mongolica - In Europe the Japanese variety *grosseserrata* is more often planted than the type, however, in northern and central Europe, it develops poorly and the shoots are often frozen back. Northern provenances are much better and in the Botanic Garden in Gothenburg, there are some good specimens.



Quercus mongolica var. *grosseserrata* (Krüssmann)

Q. muehlenbergii - An attractive tree but probably only possible to grow in southeastern Sweden in sheltered sites having a lime soil.

Q. nigra - In Germany provenances from Maryland and Delaware are recommended but only in the mildest zone on drier sites. It is hard to tell if these will be cold tolerant for Scandinavia.

Q. palustris - This species was not damaged by the record cold winters during World War II, even in Stockholm. If northern provenances are used, it can be widely planted in southern Sweden, if not in too windy of a site. Its autumn color in Sweden is far later than in the U.S. due to our cool summers and damp autumn weather. Perhaps clones more suitable for the Scandinavian climate would improve its value here. In Denmark it is planted as a street tree.

Q. pedunculiflora - Probably hardy in southern Sweden but very close to *Q. robur*.

Q. phellos - This species is damaged in Germany in cold winters. Because it can be damaged at -25°C (-12°F), it is only the hardiest clones that might be possible in the most favorable sites in southernmost Sweden.

Q. pontica - This species from the Black Sea near Georgia and Turkey is considered to be the most beautiful of the southern European oaks. It should be hardy on warm, sheltered sites in the milder zones.

Q. prionides - May be possible in southeastern Sweden.

Q. montana (*Q. prinus*) - As one of the white oaks, it is astonishingly hardy in southern Sweden and Germany. It is even very drought resistant in cultivation.

Q. pubescens - The more north it grows, the more it favors alkaline soils. It is possible to grow in milder zones.

Q. pyrenaica - This species has an elegant habit and has conspicuous male catkins. It is only hardy in a sheltered sites of the mildest zones.

Q. rubra - This is the most common of the exotic oaks in Scandinavia. It is hardy farther north than the natural distribution of *Quercus robur*. Sometimes it grows more vigorously than our native oaks, like in Scania, where there are specimens that have grown 20% better. There are specimens in Stockholm that are 20m (73ft) tall and produce regular crops of viable acorns. Provenances from cold areas in Canada are suitable for Scandinavia. As for autumn color, it is not as lovely in Scandinavia or western Europe as in America, and the leaves only turn brown. The best opportunity for a conspicuous autumn show is on a sunny and sandy site. This is why it is advised in Scandinavia to prune *Q. rubra* regularly to get a more showy shrub rather than a tree, until a reliable autumn-coloring form is found. It has been more resistant to mildew and *Tortrix viridana* than the native *Q. robur*. Even the variety 'Aurea' is planted in shaded places as it requires protection from intensive sun to keep its yellow leaves.

Q. stellata - For Germany provenances from Pennsylvania and New York are recommended, but usually difficult to get established here due to hardness.

Q. trojana - This species from the Balkans might be tested on sheltered sites having lime soil in the mildest zone. Probably not easier to grow in Scandinavia than *Q. libani*.

Q. x turneri - This hybrid of *Q. robur* and *Q. ilex* is the only evergreen oak that can be planted outdoors in Scandinavia (perhaps also *Q. x hispanica* 'Ambrozyana'). This British hybrid can grow up to 10m (36ft) tall in southern Sweden which is half the height at which it grows in England. In record cold winters, the leaves are frozen brown but it recovers. The variety 'Pseudoturneri' is also grown but only rarely. In Gothenburg there are two specimens of 4m and 5m (15ft and 18ft) tall



Quercus pontica Photo:Archivbild (Krüssmann)

and also in Alnarp two specimens are about 14m (50ft) tall. This hybrid can be planted in sheltered sites in our two mildest zones.

Q. velutina - This species is very rarely planted in Sweden but might be hardy in our two mildest zones.

The Danish National Arboretum at Hörsholm (just north of Copenhagen along the coast) has several oak species growing. The soil is clay, rich in loam. The local climate is better than most places in Scandinavia. Of the white oaks, which are difficult to establish over here due to cool and short summers [the temperatures very rarely will exceed 25°C (73°F) and on the average are 18°C (54°F)], *Q. montana* (formally *Q. prinus*) grows the best. The results are mixed for *Q. alba* and *Q. mongolica*, while *Q. bicolor* and *Q. macrocarpa* unsatisfactorily have developed. The Asian species *Q. aliena* and *Q. glandulifera* have been seriously damaged by frost.

Most soils in Scandinavia are acid and in this Century even more have become acid due to prevailing southwestern winds from the heavy industrial regions in western Europe. Only Scania and the Danish islands are rich lime-clay loam. Because this is also the mildest region in Scandinavia, it might limit the opportunity to grow tender oaks requiring an acid soil.

This was a very short survey of exotic oaks mainly in Sweden. As you may see, in order to grow the most attractive oaks, provenances and varieties must be selected with much care so that the results with the genus *Quercus* (those on the borderline of hardiness) will be satisfactory in Scandinavia.

Breeding with *Q. robur* from provenances in Scandinavia should give a better chance for attractive oaks to grow in cold regions both in Scandinavia and in Canada, but this calls for intimate cooperation between keen and enthusiastic members of the International Oak Society to exchange scion material of outstanding cultivars as well as pollen. I hope that people living near good collections or promising regions which have varied oak flora, will find an interest in this challenge. ☛

Lennarth Jonsson is a Swedish amateur oak collector who is interested in varieties of Quercus that are hardy in Sweden and have good, early autumn color and also those that have odd leaves. He is mainly concerned in species from provenances with cold tolerances. He is also interested in someone who can supply him with scionwood. Anyone who can help or would like to discuss these interests further, may contact him at the following address: Lindenäsvägen 8, S-37145 Karlskrona, Sweden. Tel/Fax# 46 455 25449.

Work Cited

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