Quercus rysophylla, a semi-evergreen oak from Mexico, growing in the wild near Ciudad Victoria, Tamaulipas. The species was first introduced to cultivation in the 1970s from Horsetail Falls, Nuevo León in the Sierra Madre Oriental. (See pages 22 to 52).

Tree of the Year: *Quercus rysophylla* Weath.

ALLEN COOMBES writes about a Mexican oak species that was introduced to cultivation in the 1970s and deserves to be more widely known.

A personal note

It is with pleasure that I start writing these pages as this species has fascinated me for many years and it is one that certainly influenced my interests and, indeed, my life. I have always worked with large numbers of species, from my days at Hillier Nurseries, to the Sir Harold Hillier Gardens and now the state of Puebla in Mexico where I am helping to document a flora of more than 5,000 species and rising. It was perhaps this species that first encouraged me to specialize. As a relatively young person at Hillier Nurseries I worked a lot with the new introductions of Sir Harold Hillier. It was about 1980 when a row of pots with small seedlings caught my eye. The enigmatic label merely read "Loquat oak, Horsetail Falls". The unusual leaves, a deep coppery bronze, were unlike anything I had seen before, and where were the Horsetail Falls? Experiences with two other oaks eventually took me to Mexico where, on my second visit, in 1996, about 16 years after I had first seen the small seedlings, I finally found the location and the oak.

Publication

Quercus rysophylla was described (Weatherby, 1910) by Connecticut-born Charles Alfred Weatherby (1875-1949). Weatherby, a contemporary of Alfred Rehder, was an amateur botanist who studied literature at Harvard, volunteered as an assistant at the Gray Herbarium and eventually became senior curator there. He worked mainly on herbaceous plants, and described many new species, particularly ferns. *Quercus rysophylla* is the only oak he named and he is perhaps best known by woody plant enthusiasts for *Magnolia ashei*, which he described in 1926. In the original description of *Q. rysophylla* he cited three specimens in the Gray Herbarium collected by Cyrus Guernsey Pringle (1838-1911). Pringle was an American horticulturist and plant breeder who collected prolifically in the USA and Mexico for the Gray Herbarium. He is estimated to have collected some 500,000 specimens which included about 1,200 new species. The Pringle specimens of *Q. rysophylla* cited by Weatherby were his numbers 10225 and 10226 (Mexico: Nuevo León: Sierra Madre above Monterrey, 2,500 to 3,000 ft, 27 March 1906) and 10379 (Mexico, Nuevo León, Sierra Madre above Monterrey, 3,000 ft, 10 July 1907). All specimens give the height of the tree as 25–40 feet. Pringle collected many duplicates and these specimens were distributed to several herbaria. From those I have seen, 10225 is in flower with only young leaves, 10226 has mature leaves with flowers and young leaves emerging while 10379 has mature leaves with immature first and second year acorns.

Weatherby indicated that his new species was in section Erythrobalanus (now section Lobatae), i.e. a red oak. He described it as a large tree with black, rough or deeply ridged bark. Leaves entire, ovate-lanceolate, leathery, to 21 cm long and 8 cm wide, cordate at the base, glabrous or with tufts of hairs in the vein axils beneath, rugose above, veins raised beneath, petiole thick, to 7 mm. He had not seen mature acorns. As Weatherby cited three specimens, Pringle 10225 (GH) was designated as the lectotype (the specimen chosen as the type if no holotype was given in the original publication) by William Trelease in 1924.

Valencia Avalos (2004) recognized 161 species of oak in Mexico making it the most oak-rich country in the world. *Quercus rysophylla* is listed as one of 76 species of red oak (*Quercus* section Lobatae) that occur there.

The name and its spelling

The epithet as originally published by Weatherby was spelled *rysophylla*. This derives from the Greek ῥυσός (rhysos) meaning wrinkled and φύλλον (phyllon), leaf. Unfortunately Weatherby made an error that has resulted in the name sometimes being misspelled. The Greek letter ῥ is aspirated and so is transliterated as 'rho', and in scientific names, normally as 'rh'. To conform to classical usage Weatherby should have used the spelling *rhysophylla*. I discussed this with Professor Stearn some years ago and he was quite surprised as he considered Weatherby to be "a good classical scholar".

The belief that this error can be corrected has resulted in some publications changing the epithet to *rhysophylla*. However the Melbourne Code (McNeill et al., 2012) does not include this as a correctable error and the need to form epithets derived from Greek in accordance with classical usage is only a recommendation. Therefore the original spelling, *rysophylla*, is regarded as correct. The incorrect spellings *risophylla, rhizophylla* and *rizophylla* are also sometimes found.

Synonyms

As *Quercus rysophylla* is such a distinct species it is not surprising that few works list any synonyms. Le Hardÿ de Beaulieu & Lamant (2006) and Marroquín (1997) list *Q. sierramadrensis* as a synonym. This is a new name published by C. H. Muller for his *Q. tenuiloba* f. *gracilis* described from Villa Santiago, Nuevo León, Mexico (*Q. gracilis* had already been published for another species). A specimen of this (Muller 2048, MO) was determined by Dennis Breedlove in 1994 as *Q. rysophylla*. The specimen, however, bears little resemblance to this species or known hybrids of it and is more likely to be *Q. canbyi* or a relative.

Common names

Quercus rysophylla is known in the USA as loquat oak or loquat-leaf oak, from the superficial resemblance of the leaves in shape and texture to those of the

loquat (*Eriobotrya japonica*). In Santiago, Nuevo León it is called encino de asta (Marroquín, 1997), which translates as flagpole oak, presumably referring to its fast growth and the straight trunks of young trees. The name encino de asta has also been applied to another Mexican red oak, *Q. candicans*.

Description

A large, evergreen or semi-evergreen tree reaching 25 m or more tall in the wild, and already close to that in cultivation. Bark smooth and pale grey when young, cracking with age and becoming dark grey, rough and deeply fissured. Young shoots hairy, becoming glabrous, green often flushed with red, prominently ridged. Leaves leathery, lanceolate to elliptic or ovate, often undulate at the margin, to 25 cm long and 8 cm wide; entire with a short bristle at the pointed apex, especially on older trees or slow growing shoots, or sometimes with shallow lobes or bristle-tipped teeth especially above the middle on young trees and vigorously growing shoots; base heart-shaped with small auricles; secondary veins 15–20 on each side of the midrib; petiole short, less than 1 cm long; downy on both sides when young when they are often bronzy red, becoming glabrous on both sides except for tufts of hair in the vein axils beneath; bright green above when mature and conspicuously reticulate with sunken veins, paler beneath with raised veins. The leaves normally turn brown and fall in the dry season, either just before, as, or just after the young leaves emerge. Acorns biennial, ripening the year after flowering and so normally found on the leafless part of the shoot with immature acorns from the current year's flowers found in the axils of the leaves, borne singly or several clustered on a very short pedicel; cup with blunt, appressed scales covering one half or less of the acorn; acorn ovoid, pointed at the tip, to 1.2 cm long.

Although normally described as a tree, a collection from Cerro de las Yucas, Tamaulipas (Dressler 1929, MO) was described as "0.4–1.2 m tall; forming extensive, dense thicket near summit."

Distribution and habitat

Quercus rysophylla is endemic to Mexico, occurring in the Sierra Madre Oriental, a mountain range in eastern Mexico usually between 500 and 1700 m altitude. Its largest populations occur in the states of Nuevo León and Tamaulipas, extending south into the Sierra Gorda where it is found in the more humid parts of Querétaro, San Luis Potosí and Hidalgo. It often grows with other species of oak including *Q. canbyi*, *Q. fusiformis*, *Q. polymorpha* and *Q. sartorii* and is normally found in humid canyons and on north facing slopes, in oak or oak-pine woods. Muller (1936) described it as common on densely wooded canyon floors and up to 25 m tall in two municipios of Nuevo León. In Hidalgo it grows with *Tilia* and *Liquidambar*. It has not been possible to confirm reports of this species in the states of Oaxaca and Veracruz. The

Distribution of *Quercus rysophylla*.

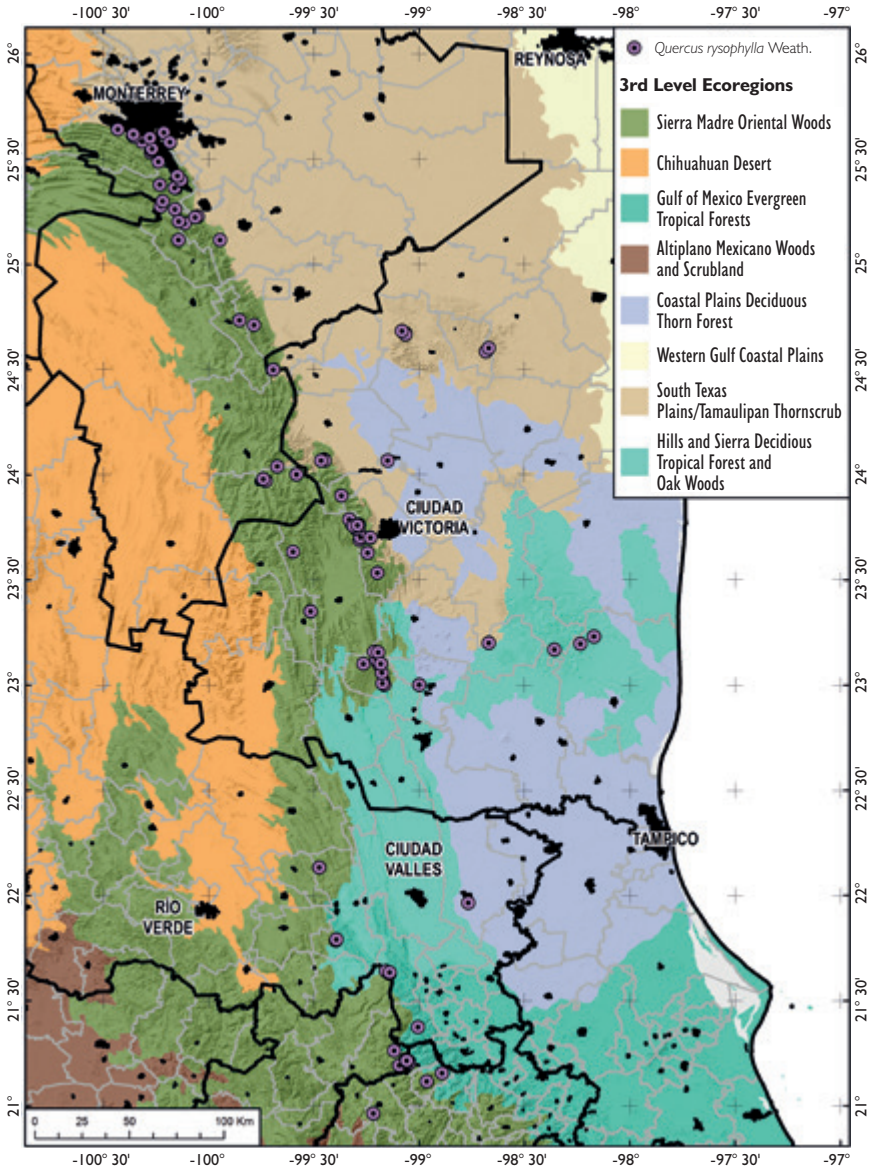

Illustration courtesy, M. C. Miguel A. González-Botello

Map edited with ESRI Arc Map 10.1, each point equals a size of about 8 km diameter and may cover several location records.

wood of *Q. rysophylla* is heavy and is used locally for various construction purposes (Cruz de León, 1994).

Threat status and protection

Due to the fragmented distribution of this species and its restricted habitat it is currently considered as Near Threatened (Oldfield & Eastwood, 2007). In parts of its range *Q. rysophylla* does have some degree of protection. The Parque Nacional Cumbres de Monterrey in Nuevo León is the largest of 68 national parks in Mexico covering an area of more than 177,000 hectares, including much of the population of *Q. rysophylla* in the area. The national parks include areas with valuable ecosystems of scientific, historical and landscape value. Part of the Sierra Gorda in Queretaro has been designated one of 41 Biosphere Reserves in Mexico, which aim to involve local people in their management. It covers about 400,000 hectares and includes populations of *Q. rysophylla*. The amount of protection offered by these areas, however, is uncertain. They have limited funding, developments within them are sometimes allowed and illegal logging occurs.

Natural hybrids

Fairey & Schoenfeld (1994) reported the discovery in 1989 of a single tree of an evergreen oak "well over 80 ft tall" which they called the "spinoza oak", growing with *Q. rysophylla* and *Q. sartorii* and it has been suggested that it is a hybrid between these species. It was growing in a deep canyon about 30 miles south of Monterrey. The leaves are similar to those of *Q. rysophylla* but are edged with ½ inch aristas similar to those of *Q. sartorii* and are bright red-purple during the growing season. It was introduced to cultivation and came true from seed, reaching 10 ft tall by 1994. Plants were distributed by Yucca Do in the early 1990s. A tree at the Stephen F. Austin State University, Nacogdoches, Texas has reached 15 ft tall.

A plant of what is probably the same hybrid is grown by Bob McCartney at the Citywide Arboretum, Aiken, South Carolina where it is called *Quercus rysophylla* × *canbyi*, although it was originally received from Yucca Do as *Q.* La Espinosa "or something like that". This plant produces acorns which have found their way to other collections. As this is a single specimen and likely to be pollinated by another species any offspring should be treated as suspect and seed from this plant appears to have produced a hybrid with *Quercus nigra* at Chevithorne Barton. Another plant raised from this seed has made a bushy evergreen tree 2.9 m tall at Arboretum des Pouyouleix and appears to be a triple hybrid, also possibly with *Q. nigra*. In 1991 Guy Sternberg found an oak in the San Isidro Canyon, SW of Santiago that was originally thought to be a hybrid of *Q. rysophylla* with *Q. canbyi*. A specimen in the herbarium of the Morton Arboretum of this collection has been determined as *Q. rysophylla* × *sartorii*.

Another candidate for a potential natural hybrid is *Q. tenuiloba*. Described by Muller in 1936 from Alamar, Galeana, Nuevo León, it was accepted as a species by Valencia Avalos (2004) and regarded as a synonym of *Q. xalapensis* by Romero Rangel (2006). The type specimen, C. H. & M. T. Muller 1125 (MO), shows a shoot bearing acorns ripening from the previous year (i.e. biennial) and foliage similar to that of *Q. xalapensis* or *Q. sartorii*, with long-aristate teeth. The leaves, however, show impressed veins and a distinctly cordate base, both characters of *Q. rysophylla*. In 1994, D. E. Breedlove annotated this as "probably *Q. rysophylla* × *xalapensis*". According to Leccinum Garcia similar plants are also found in Tamaulipas. I suspect further field work is necessary to determine the status of this taxon. The presence of *Q. xalapensis* in Tamaulipas has not been confirmed.

Introduction to cultivation

Although this is obviously a very desirable tree, it is perhaps surprising that it was introduced to cultivation relatively late compared to some other Mexican species. What must have been one of its first mentions in the horticultural literature was its inclusion in the *Hillier Manual of Trees and Shrubs* (Hillier Nurseries, 1991), the description made from a tree then 5 m tall at the Sir Harold Hillier Gardens. The first introduction to cultivation was made by Lynn Lowrey who probably first collected it in the 1970s. Lynn Lowrey (1917-1997) was a Texas horticulturist and plant collector who pioneered the use of native and rare plants in the landscape. He first visited Mexico in 1937 and he returned many times to introduce new plants to cultivation. He collected this species several times, and he almost certainly gave it the name loquat oak, perhaps due to the hard texture of the leaf. Seed from his 1978 collection at Horsetail Falls, Nuevo León made its way to Hillier Nurseries and was the first introduction to Britain. According to David Creech, Lynn Lowrey regarded this as a VIP (very important plant). In 1988 Lowrey invited John Fairey and Carl Schoenfeld to join him on a plant hunting trip to Mexico. Fairey, founder of Peckerwood Gardens, Texas, grows *Q. rysophylla* from his collections and has returned many times to collect this oak and other Mexican plants. He started Yucca Do Nursery in 1986 with Schoenfeld to distribute surplus plants and seeds, including *Q. rysophylla* and other oaks from his collections. Fairey has been quoted (Raver, 2012) as saying "If I had to have one oak, it would be rysophylla."

photograph © David Creech

Lynn Lowrey.

Sir Harold Hillier had many nurseryman friends in the southern USA and in 1979 he was invited, with his wife Barbara, to join some of them, including Benny Simpson, Tom Dodd and Gene Cline on a visit to Texas and Mexico

Foliage of *Quercus rysophylla* in Nuevo León showing variation in leaves.

(Hillier, 2014). In Mexico he was met by Lynn Lowrey who showed him the location where *Q. rysophylla* grows. The Horsetail Falls (known as Cascada Cola de Caballo in Mexico) is a well-known and spectacular 25 m waterfall in the Parque Nacional Cumbres de Monterrey. While Monterrey is often given as the location, the falls are actually a few miles into the hills SW of the town of Villa de Santiago, some way south east of the city of Monterrey. Sir Harold collected seed there of *Q. rysophylla* as well as of other oaks and many other species in different parts of Mexico.

It took a few years from these early introductions for the potential of this species to be appreciated but as its beauty became apparent it attracted the interest of oak enthusiasts. Seed was still being collected by John Fairey and was made available to individuals and nurseries. Some seed was also distributed from *Quercus rysophylla* cultivated at Yucca Do.

My first visit to Mexico, in 1995 was too far south to find *Quercus rysophylla* but in 1996 I planned another visit, this time to the north. I was joined by Maricela Rodriguez and Kevin Nixon in Sonora and we headed east from there. It turned out to be a very dry year with few acorns, some having fallen several months before we arrived, such as the very beautiful *Q. albocincta*, since introduced and now in the collection at Chevithorne Barton. Kevin had to leave us somewhere in Chihuahua and we continued towards Nuevo León. In spite of arriving late in Monterrey, and a burst tire, we continued to the Horsetail Falls and I can remember the emotions I experienced as we drove along the road that Sir Harold must have travelled, under large trees of *Q. canbyi*. The falls were not disappointing, as we stood in front of the plume-like cascade of water, what was disappointing was the complete lack of *Q. rysophylla*, only a few trees of *Q. polymorpha* and large trees of the plane that was later to be named *Platanus rzedowskii* by Kevin Nixon and Jackie Poole.

As we were collecting in a National Park we had to be accompanied by a government representative from Monterrey and after meeting the following

photograph © Maricela Rodriguez-Coombes

Known as 'Cascada Cola de Caballo' the Horsetail Falls, at 25 metres can be found near the town of Villa de Santiago in Mexico.

morning we finally found the oak, trees about 25 m tall growing on humid slopes above the falls, with numerous acorns of *Q. rysophylla* mixed with those of *Q. polymorpha* on the ground. This was early December and often at this time of year we find acorns baked dry by the hot sun under trees. Here, however, they were in the shade, nestled among rocks and kept moist by cool water trickling over them: they were in perfect condition.

I also made a further introduction from a tree in northern Hidalgo, Mexico, close to the border with Queretaro in 2008 and was able to show this species growing near the Horsetail Falls to members of the IDS when my wife and I led the tour to Mexico in 2008 (Howells, 2009). Seed has been collected mainly from Nuevo León by others since then, including Bob Berry, Guy Sternberg, Thierry Lamant, Sean Hogan and Rubén Marroquín. Seed from cultivated plants had also been collected and distributed.

Quercus rysophylla in cultivation

It should be noted that the author has not seen material of many of the plants mentioned here. While most of those recorded as collected in the wild can be

expected to be true to name, others may not be. Much of the seed distributed from cultivated sources, or plants distributed commercially from nurseries that obtained this seed, have given hybrids. In addition, *Q.* 'Maya' was originally distributed as *Q. rysophylla* and grafted plants received as the species before the name was applied may prove to be this. Current sizes given here refer to measurements in 2015.

Argentina

A single tree of *Q. rysophylla* grows at the Grigadale Arboretum, about 500 km south of Buenos Aires, Argentina. Roderick Cameron researched the history of the plant there from entries in diaries kept by his father Duncan, who noted the oaks he had at the beginning of each year, followed by any acquisitions. The first mention of *Q. rysophylla* was on 1 January, 2001, the entry referring to a plant in a pot, indicating that perhaps the seed was received in 2000. The entry for 18 September, 2001 reads "Yesterday I planted Q. Rysophylla". There is no further information on the origin of the seed. In 2014 it measured 4.20 m tall with a circumference of 57 cm. See also under Foliage colour, pp. 41–42.

Australia

Bill Funk, at Mereweather Estate, Victoria, has two trees of *Quercus rysophylla* grown from seed, wild collected in Nuevo León, Mexico that are now 5 m tall. Fruiting for the first time this year they survive 40 °C in the summer and are semi-evergreen at the end of the mild winters. A nursery has rooted this from cuttings and Bill suspects that it is now in other gardens. He also received seed from Yucca Do Nursery, Texas, in the early 1990s which has given hybrids. These are a similar size to the above with slightly bullate-textured leaves. In autumn, the top half of the trees have a nice red autumn colour and the bottom half of the tree stays semi-evergreen.

Belgium

Arboretum Robert Lenoir (Charles Snyers d'Attenhoven)

A 60 cm seedling given by Eike Jablonski and grown from acorns collected in Nuevo León was planted in 2007. Today the tree is 1.6 m tall.

Arboretum Wespelaar (Philippe de Spoelberch) A grafted tree planted in 2005 seems healthy but the bark has split at the base. It is now 4.5 m tall with a circumference of 17 cm at 1.5 m. The best plant here is from seed collected by Thierry Lamant in Nuevo León. Planted in 2010 it is now about 4 m tall with a circumference of 11.5 cm at 1.5 m.

France

Arboretum des Pouyouleix (Béatrice Chassé/Gérard Lionet) A tree raised from seed collected by Thierry Lamant in Chipinque Park, Nuevo León, at 1200 m was planted in November 2004 measuring 23 cm and is now nearly

The foliage of *Quercus rysophylla* growing at Grigadale Arboretum in Argentina: colouring in late autumn [Perhaps due to the stress of waterlogging] (*above*) and emerging in the spring (*right*).

8 m. It is completely evergreen except in February 2012 during the very long cold spell (15 days at -17 °C at night with daytime temperatures never above -8 °C) during which it lost all of its leaves. It is planted in full sun, in a fairly windy, unprotected spot. Béatrice Chassé (2012) described her plant as "the most beautiful tree in the world".

Six trees raised from seed collected from the Stephen F. Austin State University in Nacogdoches, Texas, in 2006 were planted in 2008. They are now between 4.5 and 6 m tall. They vary slightly and the beautiful red winter colour of the leaves indicates that hybridization may be involved. Completely evergreen, they are planted in a very protected spot, on a south facing steep slope. They retained their leaves (although some were damaged) during the cold spell in February 2012.

Chocha (Michel Duhart) A plant bought from Mallet Court at Courson in 1992, measuring between 50 and 60 cm was 12 m tall in 2004 (Grimshaw, 2009) and is now between 20 and 25 m with a circumference of 1.80 m (57.3 cm dbh). This tree is the parent of *Q.* 'Chocha'. An accurate measurement could prove it to be the largest tree of this species in cultivation. The current measurement of dbh is slightly larger than that of the tree at Hillier Gardens.

Arboretum de Cayrols (Thierry Lamant) A two-year old tree planted in 2001 when about 40 cm tall suffered from scolytids in 2008/2009 when it was about 2.5 m tall but resprouted from the base and is now about 2.5 m tall. In 2005 it

survived 19 days of freezing temperatures (night and day) with no damage.

Arboretum du Hanouard (Henri de Brem) A plant bought in 1998 from Mallet Court measuring about 40 cm is now 8 m tall. Interestingly, the soil is heavy clay and often water-logged. It did not suffer from the cold spell in 2012 at -17 °C.

Brive (Jean-Louis Hélardot) A plant bought at the Arboretum de Balaine in 2003, 1 m tall and four years old is now 10 m tall. It did not suffer during five consecutive nights in February 2012 at -19 °C.

Arboretum de Verrières (Nathalie de Vilmorin) Two plants of unknown origin received in 2008 and 2009 are now 2.1 m and 1.9 m tall respectively.

Kerners (Brigitte Fourier) A plant bought from Mallet Court in 1993 is now 3.5 m tall.

Quercus rysophylla at La Bergerette.

L'arboretum Albert Dumas (Albert Dumas) Raised from seed collected by Thierry Lamant in Nuevo León, Chipinque at 1,200 m, a tree planted here in 2006 measuring 36 cm, is now 2.9 m. It suffered from the severe cold spell in February 2012 (14 days of intense cold at -19 °C) but has grown back well.

Arboretum la Bergerette (Shaun Haddock) Those that think the south of France enjoys a balmy climate should visit this garden, situated at about the same latitude as central Oregon, as I did in the scorching summer of 2003. La Bergerette experiences not only extreme heat but also long periods of cold weather with temperatures down to -13˚C and a week below zero, as well as severe droughts (only 380 mm of rain) in 2010/2011, gales and tornadoes, not to mention the predations of voles, moles and rabbits (Haddock, 2012). In spite of this, trees of *Q. rysophylla* there have thrived, additionally shrugging off a heavy spring snowfall which damaged other trees. When Shaun was about to plant young trees from my 1996 collection, having recently experienced the hybridization problem with this species, I suggested that he plant them in a group in the hope that there may in the future be a source of a seed that does not produce hybrids. In spite of the climate these trees have grown extremely well and the best, planted in 1997 was 11.6 m tall in 2008. They have grown well since then but Shaun is waiting for another accurate measurement before he gives an up-to-date height. They have also fruited well and my advice seems to have paid off, the seed giving some plants that seem to be true *Quercus rysophylla*, although one of the trees does produce hybrids. There is also a smaller tree on the property grown from seed collected by Thierry Lamant and trees grown from acorns from Yucca Do that appear to be true to name.

Italy

Quercus rysophylla was introduced to Italy by landscape architect Ivano Fieni who bought a seedling of the Hillier 622 collection from Hillier Nurseries in 1982 and planted it the same year in his garden in Reggio Emilia, NW of Bologna in northern Italy. In 1988, Francesco Vignoli of Vignoli Vivai, Pistoia, Italy, saw this plant, already a nice tree but without seeds, and started to propagate it by grafting. He reports good results on *Q. rubra*, average on *Q. palustris*, poor on *Q. cerris* and with no takes on *Q. robur*. Some of the grafted trees were planted in his nursery as stock plants and he started to promote this species commercially. In 1996, a specimen from one of these trees was sent by the Romiti Donello nursery in Pistoia to Hillier Gardens for identification. After 10 to 12 years the trees in the nursery started to produce seed. Fruit production is abundant but in most years all seeds fail to ripen and in only a few years is good seed produced. Most of these come true with about 2.5% producing what are apparently hybrids with foliage more closely resembling that of *Q. palustris* or *Q. rubra* and produce beautiful red, late autumn colour. Some of the apparent hybrids are said to resemble

photograph © Ivano Fieni

A tree of Hillier 622 in Reggio Emilia in Italy.

Quercus 'Maya'. The tree in Reggio Emilia is now about 15 m tall with a spread of 14 m and a diameter of about 63.7 cm. It is the mother tree of all *Q. rysophylla* grown in Italy and produces 600 to 1500 seed every year which are collected and propagated by a local nursery. A small percentage of these are said to be different to the parent, some resembling *Q.* 'Maya'.

According to Vignoli, the grafted trees grew quickly, reaching 10 m tall and 80–90 cm circumference at the base in 16 to 18 years. When some had to be cut down for safety reasons following a storm he noted that the trees had produced very nice, hard, white wood, without cracks or defects. Vivai Vignoli still offers open ground grown trees of *Q. rysophylla* and Vignoli recommends transplanting them in March, immediately before the new growth starts.

Luxembourg

Three plants of *Q. rysophylla* raised from seed collected from a cultivated plant in Texas were grown at the Ettelbruck Arboretum on a heavy clay soil with some gravel and a pH of 6.7–6.9. All suffered severe chlorosis and died after heavy frosts.

Mexico

Tree enthusiasts might assume that Mexico, with its hugely diverse flora and more oaks than any other country would be awash with big tree collections. Unfortunately this is not the case as the passion for plant collecting is rare here and a limited selection of plants is available commercially. A few plants of *Q. rysophylla* are grown in the garden where I am based, the University

Botanic Garden in Puebla, but they do struggle. This is undoubtedly due to the extreme climate with long winter droughts accompanied by high temperatures and very low humidity, which I think causes problems with the establishment of the root system. In addition, flooding can cause problems when the heavy summer rains arrive. The tallest here are still only 2 m tall after five years but are starting to grow strongly. We have better hopes for one recently planted in a more humid part of the garden.

In nurseries around Monterrey in the north of Mexico, and close to where it grows naturally, this tree is available commercially. Vivero Imperial (http://www.viveroimperial.com/) offers a range of trees including several oaks. Among these is *Quercus rysophylla*, which they call encino de asta. It may be from here that come trees planted in the streets of Villa Santiago, along with *Q. polymorpha* that visitors will see on the way to the Horsetail Falls. In Monterrey itself, the common oak seen planted in the streets and parks is *Q. fusiformis*, *Q. rysophylla* is not used in the city as it becomes chlorotic.

New Zealand—Hackfalls

Bob Berry first collected in Mexico on the 1982 IDS tour. Since then he made a further four or so visits for oaks and other plants and collected seed of

Quercus rysophylla with untoothed leaves at Hackfalls, New Zealand.

Bob Berry, 100 years, next to a 25 year old specimen of *Quercus rysophylla* at Hackfalls, New Zealand.

Q. rysophylla from Chipinque near Monterrey on his last visit in 1990. This collection (Berry 8987) gave three trees, all now about 12 m tall. Apparently the seed produced by the largest of these always seems to come true. In 2004 Bob and Anne invited me to spend a week with them to help with identifying some of the oaks and to collect herbarium specimens, quite a task in this enormous collection rich in species not quite hardy in more temperate regions.

Scandinavia

In southern Sweden, Leif Klingström has concluded, after several attempts to grow it in Ängelholm, that *Q. rysophylla* is not hardy there. He has more hope for *Q.* 'Maya' and reports that it is grown in Denmark and mentions a small plant he noticed growing in a park (Solgårdsparken) in Strøby Egede outside Køge south of Copenhagen.

Spain

At Iturraran in the north of Spain, Francisco Garin reports that a tree of wild origin was planted in 2000 and is now 8 m tall. A younger plant also of wild origin was planted in 2014 and is 1 m tall.

UK

Quercus rysophylla was introduced too late to be included in Bean's Trees and Shrubs Hardy in the British Isles or in the supplement. The tree at the Hillier Gardens is perhaps the best known in the UK and is from Harold Hillier 622, collected at the Horsetail Falls in 1979 and planted in the early 1980s. Sir Harold also collected a herbarium specimen at the same time, which is at the Harold Hillier Herbarium. At 19.6 m this tree is currently the UK Champion Tree of this species. By 2009 it had become impressive enough not only to be included in *New Trees* (Grimshaw, 2009) but to receive a well-deserved, glowing write-up. The author wrote "Of all the trees in this book, *Quercus rysophylla* is the one that has made the greatest impression on me (JMG) wherever it has been seen, and if only one 'new tree' were to be grown, this should perhaps be it." He described the Hillier tree, which was already 17.6 m tall when he saw it in 2008, as "magnificent in all respects". Increase in size of this tree since 1990 is shown in Table 1, p. 38. The canopy spread in November 2015 was 14.5 m.

Hugh Angus (2014) mentioned that this tree has survived -18 °C, this was probably in the winter that I noticed all the leaves were lost. The tree, however, did not blink and the following year looked as good as ever. Other trees at Hillier Gardens derive from my 1996 collection (Coombes 393) which have reached about 6 m, and one from Bob Berry at 9 m. These are all planted in the Brentry Woodland area of the gardens on an acidic, sandy soil. Plants from the earlier introduction of Lynn Lowrey were planted in an area of heavy clay soil and most have since died, probably due to waterlogging. One remaining plant, probably from this collection is growing slowly with some dieback.

photographs © Allen Coombes, Mark Weathington

Above, Smooth bark becoming cracked, tree 19 years from seed at Hillier Gardens.

Left, Trunk of the large tree at Hillier Gardens with Roy Lancaster.

The slow-growing plant differs from the more vigorous ones in having smaller, mostly untoothed leaves, such as those seen on herbarium specimens collected, presumably from old trees, while more vigorous plants have large leaves that are more often toothed or even slightly lobed, particularly on the second growth flush.

RBG Kew has four trees of *Q. rysophylla*, all of wild origin, a single specimen of Hillier 622 and three younger trees. In 1981 when the Hillier plants were still young I took one of the Hillier 622 seedlings to the Kew herbarium in an attempt to identify it, as we had no literature on Mexican oaks. There was not a single specimen in the entire Mexican section of the herbarium that matched our plant so I left the seedling at Kew and that is the oldest tree of this species there today. It was finally identified by Nigel Taylor who matched it with the description and illustration in Trelease's *The American Oaks*. At Kew, the Hillier tree is now (November 2015) 6.1 m tall and 42.0 cm diameter with a spread of 6.1 m.

There are also three trees at Kew donated by Lady Anne Palmer and deriving from a collection by Bob Berry in October 1991. The following

measurements were made in November 2015. The largest, planted in 1995 was 16 m tall and 39.8 cm diameter with a spread of 6 m. The smaller trees were 10.6 m tall and 22.6 cm diameter with a spread of 5 m (planted 1994) and 13.7 m tall and 29.9 cm diameter with a spread of 5.8 m (planted 1995). At Buckingham Palace, a tree given by Hillier Gardens was planted in January 2003 but has grown slowly, probably because of its position and is now 4 m tall with a spread of 3 m. A tree at Westonbirt from my 1996 collection was planted in 2004 and is now 10 m tall and 13 cm dbh.

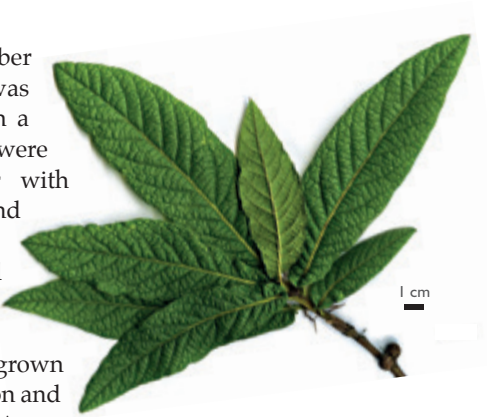

image © Jan De Langhe

Above, foliage of *Quercus rysophylla* with young acorns, Hillier Gardens.

Table 1. Growth of *Q. rysophylla* at Hillier Gardens

Month	Year	Height (m)	dbh @ 1.5 m (cm)
SEPTEMBER	1990	5.2	7.9
MAY	1997	10.5	18.6
NOVEMBER	1999	12.0	27.0
OCTOBER	2000	13.3	30.2
JANUARY	2006	16.0	39.8
AUGUST	2007	16.8	42.4
OCTOBER	2008	17.6	45.2
JULY	2009	17.8	46.0
MARCH	2010	18.2	46.5
SEPTEMBER	2013	*	52.0
NOVEMBER	2015	19.6	55.9

* a measurement of 20.4 m for this date is considered inaccurate

We might expect this species to do well in the south of England but there are also plants further north and in colder parts of the country. A fine young tree is growing well in a sheltered position at Thenford House in the collection of Lord Heseltine and a little further north, Lloyd

Kenyon grows it at Gredington, Shropshire. He has two trees, the larger of which, at 5 m tall, is probably a hybrid, the smaller one, grown from seed collected in Mexico in 2009 is true to name. In his Garden Diary for 7 December, 2010, Grimshaw described how, at Colesbourne, Gloucestershire, after the coldest night of the year so far, all his plants, including *Q. rysophylla* were covered in frost. This was the country's coldest December since records began and the tree survived temperatures down to -15 °C. Unfortunately it later became chlorotic, probably because of the shallow, stony, alkaline soil there and had to be removed.

In Wales, Thomas Methuen-Campbell grows *Quercus rysophylla* at Penrice Castle. His first plant of this of cultivated source, was planted in about 2003 and reached about 15 to 20 ft before being killed when a branch from another tree fell on it. He currently has three plants from my 2008 collection in Hidalgo, which are about 1.5 m tall. A fine young tree at Roath Park, Cardiff is described as the Glamorgan Champion (Cardiff Parks, 2015). In February 2015 it was 9 m tall with a girth of 42 cm (13.4 cm dbh). The excellent photographs on the Cardiff Parks website show this tree is correctly named.

USA

According to David Richardson, *Q. rysophylla* is used very rarely in landscapes and is not widely known in Texas, being mainly planted in arboreta and collectors' gardens. Peter Loos who said this is a great tree and his favourite

The large tree at Stephen F. Austin State University.

Mexican oak, reported that trees raised from Lynn Lowrey's seed were planted in many places around Houston as well as other parts of Texas, together with other oaks that he collected such as *Quercus polymorpha* and that initial doubts by some about its hardiness were unfounded.


photograph © David Creech

A mature acorn, Stephen F. Austin State University.

Creech (2016) wrote a glowing report on the fine tree of *Quercus rysophylla* growing at Stephen F. Austin State University, Nacogdoches, Texas. This tree, planted by Creech in 1988 from a collection by Lynn Lowrey, was over 18 m tall in 2011 and 51.7 cm dbh in 2016 and Creech considered it to be the largest in the USA. It survived a record low of -18 °C in 1989, two hurricanes (Rita, 2005 and Ike, 2008), and record heat and drought in 2010 and 2011. In addition Creech noted that it is not affected by tent moth caterpillars that have caused problems with many of the native oaks there. Peter Loos reported that he had seen the leaves of this tree turn black and the tree defoliate in one cold winter. According to Creech about 90% of the seedlings from this tree come true. It is possible that the tree is pollinated by other specimens of the species growing there although these are several hundred metres away. There are also three large trees about 60 ft tall at Trinity University, San Antonio, Texas that are suspected to be Lynn Lowrey collections. Many of the acorns from these trees come true. According to Sean Hogan there is a very good tree at least 10 m tall planted by Lynn Lowrey on a hillside at the old Color Spot Nursery near San Antonio, Texas. For a time in the 1980s Lowrey collected for this nursery (it was then Lone Star Growers).

In Raleigh, North Carolina a tree of *Q. rysophylla*, from a wild collection by Yucca Do was planted in 1992 at the Juniper Level Botanic Gardens of Plant Delights Nursery and is about 7 m tall. At the nearby J C Raulston Arboretum a tree of *Q. rysophylla* that was 30 cm in 1991 reached 4.25 m in 1999 but had to be removed in 2001 for "management" reasons. They currently have small seedlings from Stephen F. Austin State University.

In the Citywide Arboretum, Aiken, South Carolina, Bob McCartney has a "large tree" of *Q. rysophylla*, originally from Yucca Do via Tony Avent of Plant Delights in Raleigh, North Carolina. It produces a lot of acorns which give hybrids with both *Q. falcata* and *Q. shumardii*. A tree of *Q. rysophylla* also grows at the Hampton Roads Agricultural Research and Extension Center, Virginia Beach, Virginia. Guy Sternberg, founder of Starhill Forest Arboretum, Illinois, first encountered *Q. rysophylla* when collecting with Yucca Do nursery in Nuevo León in 1991. Certain that it would not survive the Illinois winters, he grew it, along with other non-hardy oaks with winter protection for "more than a few

years" before it finally succumbed. At the University of California Botanical Garden, Berkeley, there are three wild source trees. Two of these came from Yucca Do and were planted in 1993 and 2001 respectively, and are now about 40 ft and 25 ft tall, while the third came from the University of California, Santa Cruz Arboretum, and is now 50 to 52 ft tall. A tree at the University of Washington Arboretum, Seattle, probably qualifies as the most northerly location where this species is planted in the US. Collected south of Monterrey, Nuevo León, it was received from Lynn Lowrey as a 45 cm seedling in 1983 and planted in its current position in 1992.

Following the report on this species by David Creech, Mark Snyder has added it to the Approved Street Tree Species List for Eugene, Oregon. A little further north, Sean Hogan is using *Q. rysophylla* and several other Mexican oaks as mainstays in design work in and around Portland. Also in Portland, James Gersbach reports a tree at the Hoyt Arboretum that is growing steadily and is only damaged in the coldest winters. In Florida, Smith and Black (2013) include *Q. rysophylla* in a list of under-utilized trees. According to Smith (pers. comm.) it is not common in Florida but has been planted in three or four public gardens and a few private collections.

Foliage colour

The striking colour of the young foliage is what first attracted me to this species. In many plants the leaves emerge a deep bronze-purple before turning

Marcescent leaves with young foliage and male catkins at Stephen F. Austin State University.

photograph © Rubén Marroquín

Opposite, Foliage of a *Quercus rysophylla* hybrid at Hillier Gardens.

Left, Foliage of *Quercus rysophylla* colouring in winter, Nuevo León, Mexico.

to dark green and this is regarded by many as one of the attractive features of this species. Autumn colour is rarely mentioned and *Q. rysophylla* does not normally show any, the leaves usually turning brown before they fall. Rubén Marroquín, however, did send photographs of this species taken in winter in Nuevo León with purple-tinged mature leaves, showing that this is possible (see p. 31). A posting by Roderick Cameron (2014) about a tree at Grigadale Arboretum, Argentina with bright red-purple leaves in late autumn (June 2011) created quite a discussion (see also, p. 31). The tree started to die back after the photographs were taken but after a hard pruning in 2013 produced two strong leaders, one of which was removed in 2015. It is now recovering and has not shown the same colour since. In my opinion the unusual colour was caused by stress due to waterlogging.

Hybrids in cultivation

My first experience with garden hybrids of *Q. rysophylla* was in 1996 when the large tree at Hillier Gardens produced fruit and a plant raised at Hillier Gardens from this seed is clearly a hybrid. The influence of *Q. rysophylla* shows in the deeply impressed veins, but the long petiole and the lobing suggest that the male parent is one of the deciduous North American red oaks such as *Q. rubra*. It may never be possible to know this for sure as several related species and hybrids grow nearby to the parent tree. The following year while giving a group from Rosemoor a tour of the Gardens I proudly stopped in front of the large *Q. rysophylla* and told its story. The reaction was not one I expected, or was used to. Apparently this species was growing at Rosemoor but it did

photograph © Allen Coombes

not look at all like the one we were standing in front of. Curious, I asked them to explain, and apparently the leaves on the Rosemoor trees were much more lobed and I started to think—maybe a hybrid. Specimens for the herbarium from two different trees soon followed with details of their origin. The trees at Rosemoor came from a nursery in England. The seed had been collected by Michael Frankis (Frankis 192) from a cultivated tree at the Yucca Do nursery in Texas. From the specimens it seemed possible that the male parent of both was *Q. falcata*. In 1998 I collected a specimen of a similar hybrid from a tree at Arboretum Chèvreloup in France that had been received from Mallet Court. A tree at Chevithorne Barton, received in 1992 from a cultivated source as *Q. rysophylla*, is a hybrid, possibly with *Q. sartorii* and was 13 m tall in 2012.

According to David Creech, the largest tree of *Q. rysophylla* at Stephen F. Austin State University, Nacogdoches, Texas produces some "crazy hybrids", although about 90% of seedlings come true. David Richardson also comments that these seeds generally breed true, although sometimes they can produce hybrids with *Q. nigra* or *Q. pagoda*.

Some of the acorns from the trees at Trinity University produce hybrids with *Q. shumardii* and a plant of this origin about 20 ft tall grows at UT Southwestern Medical Center, Dallas, Texas.

Hybrid or not?

With hybrids in cultivation that are grown as *Q. rysophylla* it is important to know how to distinguish them. The features of *Q. rysophylla* to check for are the leaf lobing, the number of secondary veins on the leaf, the deeply

photograph © David Richardson

Quercus rysophylla × *shumardii* at the University of Texas, Southwestern Medical Center, in Dallas.

impressed secondary and tertiary veins, the very short petiole (less than 1 cm), and the often heart-shaped, auriculate leaf base. The leaves of *Q. rysophylla* tend to be unlobed, although lobes can be present on very vigorous shoots, particularly on young plants. The species that can be a male parent to hybrids often have lobed leaves so if the leaves of a plant are consistently lobed then it is a hybrid. *Quercus rysophylla* has quite a large number of lateral veins (usually 15–20), hybrids tend to have fewer veins. The impressed leaf veins are often present in hybrids. They are not evident in the "spinoza" oak at Stephen F. Austin State University but can be seen in Bob McCartney's plant of this, said to be of the same origin, and are very distinct in the Chevithorne plant thought to be of this parentage. They are also not evident in the *Q. rysophylla* × *shumardii* at UT Southwestern Medical Center, Dallas. The petiole is often quite short in hybrids and

photograph © James MacEwen

Above, suspected hybrid of *Quercus rysophylla* and *Quercus sartorii* at Chevithorne Barton.

may not be a reliable character in many cases, although the Chevithorne hybrid (photo) has long petioles. The heart-shaped and auriculate leaf base does tend to be lost in the hybrids and its absence is regarded as a good character for recognizing them.

photograph © Béatrice Chassé

Quercus 'Belle d'Aquitaine' at Arboretum des Pouyouleix from an unknown cross.

New cultivars

Quercus rysophylla has not proved to be very variable in cultivation but several hybrids have been raised and some already distributed. These are named here. In all of them, *Quercus rysophylla* is the seed parent, while the male parent is another red oak of uncertain identity.

***Quercus* 'Belle d'Aquitaine'**

Béatrice Chassé. New cultivar. *Quercus rysophylla* × ? Tardily deciduous, fast growing tree with a beautifully symmetrical habit. Does not appear to be susceptible to disease or damage by insects. Trunk whitish grey. Buds light brown, ovoid, 0.5–0.8 cm long. New shoots red and green, pubescent. The elongated, slightly rough-textured leaf blade measures from 10 to 19 cm long by 3.5 to 7 cm wide; petiole 0.6–1.1 cm. Midvein raised on both sides of the blade, the secondary veins seven to eight pairs, slightly raised on the underside with a reticulate network of tertiary veins. Leaf base auriculate to different degrees on different leaves; five to six toothed lobes separated by fairly shallow sinuses (teeth very long, up to 4 mm in length). New leaves light silvery green infused with coppery red; pubescent on both sides with long fine hairs. As the leaves mature they retain a reddish copper hue becoming a medium dark green with pubescence restricted to conspicuous tufts of axillary hairs. Second flush of young leaves red, becoming green and as they mature, retaining this distinct reddish hue at the distal end. Autumn colour from deep orange to red. Acorns not yet produced.

Standard Specimen: Béatrice Chassé APO737, 27 Nov. 2015. Harold Hillier Herbarium (HILL) no. 7891. Cultivated Arboretum des Pouyouleix, France.

A seedling was received at Arboretum des Pouyouleix from Michel Angeard as *Q. rysophylla* with no further details. It was planted in October 2006 at 23 cm tall and is now between 6 to 6.5 m in a windy, unprotected

The foliage of *Quercus* 'Chocha' on a tree growing at Iturrarran in northern Spain, in spring (*left*) and autumn (*right*).

position. It has been propagated by Pavia Nurseries. The name refers to the region of France in which the Arboretum des Pouyouleix is found.

***Quercus* 'Chocha'** Francisco Garin. New cultivar. *Q. rysophylla* × ?
Tardily deciduous tree, young shoots greenish brown, slightly grooved, with many whitish lenticels. Leaves slightly leathery, intermediate in texture between *Q. rysophylla* and *Q. rubra*. Blade oblong to obovate, 12–20 cm long × 6–13 cm broad, broadest in the upper third of the blade, apex acuminate, base rounded, sometimes irregular, margin with four to seven pairs of acute lobes, ending in aristas up to 5 mm long. Upper surface somewhat bullate, dark green, underside lighter green, with tufts of stellate hairs in the axils of the lateral veins; secondary veins six to seven pairs, ascending, ending at the end of the lobes. Veins clearly raised on the underside, on the upper side, the principal vein is raised in the proximal half and sunken in the distal half. Petiole short, thick, 1–2.5 cm long × 2 mm broad. The leaves turn orange in autumn. Acorns not yet produced.

Standard specimen: Jan De Langhe 019941, 7 Sept. 2015. Harold Hillier Herbarium (HILL) no. 7892. Cultivated Jardín Botánico de Iturraran, Spain.

Quercus 'Chocha' is a seedling from the large tree of *Q. rysophylla* growing at Chocha, Ustaritz, SW France, the property of Michel Duhart. It is thought that the most likely pollen parent was *Q. rubra* but it could also have been *Q. palustris* or *Q. texana*. The offspring from this tree is apparently very uniform in appearance. The original plant of *Q.* 'Chocha' was planted in 2007 and is now about 5 m tall. It is being propagated by Pavia Nurseries.

***Quercus* 'Maya'** Eike Jablonski. New cultivar. *Q. rysophylla* × ?
A hardy selection of hybrid origin with Mexican species *Quercus rysophylla* as

Standard Specimen of *Quercus* 'Maya' (HILL).

Foliage of *Quercus* 'Maya' from Arboretum Kalmthout, Belgium.

one parent. Small tree, 5 × 2.5 m but expected to become bigger. Branchlets initially brown-red becoming greenish, ridged, with brown stellate tomentum and silky hairs, later greyish-brown, glabrous, with small pale lenticels. Leaves evergreen, immature leaves pinkish red, 14–20 × 4–7 cm, oblanceolate to acutely obovate, base sometimes attenuate, mainly rounded to subcordate (rarely slightly auriculate!), upper surface glossy and rugose with prominent sunken veins, lower surface largely glabrous, but with white to slightly brown axillary tufts of tomentum along the midrib, veins prominent, 8–12 secondary veins on each side of the midrib, margins undulate and revolute, with three to seven shallow bristle-tipped teeth or shallow lobes with rounded sinuses in the upper two thirds of the leaf blade, apex acute to apiculate; petiole 3–6 mm long, glabrous. Acorns not yet produced.

Grown for its ornamental immature leaves which emerge bright pinkish-red and change colour slowly until summer.

Standard Specimen: A. J. Coombes 970915, 28 Sep 1997 (as *Q. rysophylla*). Harold Hillier Herbarium (HILL) no. 2098. Cultivated Bömer Nursery, Zundert, NL, originally from Mallet Court Nursery, GB.

The name reflects the Mexican origin of *Q. rysophylla*.

This has been grown and distributed by Bömer Nurseries, Zundert, NL for some time. It has become popular for its hardiness and the colour of its young foliage and was named best novelty at the Groot Groen exhibition in Zundert, NL in 2006.

Of the cultivars described here, *Q.* 'Maya' is the closest to *Q. rysophylla* in

its shallow lobes and short leaf stalk with a sometimes slightly heart-shaped base. This led to it being distributed as a form of *Q. rysophylla* for many years. It differs from *Q. rysophylla* in the fewer, less deeply impressed lateral veins and the more distinctly lobed and toothed leaves.

Unfortunately the original tree had to be cut down a couple of years ago but David Bömer reported that the only damage it ever received was the red young foliage can freeze and all leaves can turn brown in very cold winters but the plants always recovered by producing new young foliage in late April and May. At Trompenburg Arboretum, Rotterdam, the Netherlands it was planted in 2007 in soil of pH 7. The leaves are red at first becoming chlorotic then greener in late summer. It is slow growing, with some bark splitting at the base and has reached 2.5 m. At Arboretum Wespelaar, Haacht (Belgium), planted in 2014, it has reached 2.4 m with a circumference of 5 cm. At Arboretum Robert Lenoir, Rendeux (Belgium) a grafted 1.8 m tall tree that was a gift from Jo Bömer (as *Q. rysophylla*) was planted in 2004. It was badly damaged in February 2012, but is alive, height unknown. In Kruchten, Germany, close to the border with Luxembourg, Eike Jablonski reports that a tree grafted on *Q. rubra* and received from the Bömer nursery ten years ago has only grown 10 cm since then and is very chlorotic. The soil is shallow clay over rocky dolomitic marl with a pH of 6.8–7.0 and temperatures there dropped below -22 °C in 2011 and 2012. Several other red oaks including Mexican species grow well there.

At Iturraran, Spain it was planted in 1994 and is now 6 m tall. At Chevithorne Barton it has reached 3.5 m. John Grimshaw planted *Q.* 'Maya' at Colesbourne but noted that last time he saw the tree it was looking a bit chlorotic leading him to the conclusion that *Q. rysophylla* does not like lime. He also mentioned a tree showing a good young foliage colour seen in the garden of Arabella Lennox-Boyd at Gresgarth Hall, Lancashire, England. At Westonbirt it was planted in 2010 and is now 4 m tall.

In an article praising the qualities of *Q. rysophylla*, Vignoli (undated) wrote about *Q.* 'Maya' in Italy where it is grown at Vivai Vignoli, that it is quite different from the *Q. rysophylla* that arrived in Italy with perhaps less beautiful foliage but is very spectacular in its bright pink, almost purple spring foliage.

***Quercus* 'Zehra'** Eike Jablonski. New cultivar. *Q. rysophylla* × ?
A hardy selection of hybrid origin with Mexican species *Quercus rysophylla* as one parent. Currently a small tree, ultimate size unknown. Branchlets initially greenish, ridged, with brown stellate tomentum and silky hairs, later greyish-brown, glabrous. Leaves evergreen, 5.5–12 × 4.5–6 cm, oblanceolate, acutely obovate or obtrullate, base obtuse, upper surface glossy and rugose with prominent sunken veins, lower surface pubescent with whitish axillary tufts of tomentum along the midrib, veins prominent, 5–8(–10) secondary veins on each side of the midrib, margins undulate and revolute, with mainly

three prominent lobes with acute to obtuse sinuses, but also up to seven shallow lobes or rarely bristle tipped teeth, apex acute to rarely apiculate; petiole 4–10 mm long, glabrous. Fruits not seen. Grown for its ornamental evergreen appearance.

Standard specimen: A. J. Coombes s/n, 27 October 2002. Harold Hillier Herbarium (HILL) no. 3615. Tree 10 m tall, cultivated Karaca Arboretum, Yalova, Turkey.

The original tree was discovered at the Karaca Arboretum during an International Oak Society tour to Turkey in 2002. Hayrettin Karaca sent propagating material to Pavia Nursery the next winter and asked that it be named after his daughter. Its discovery was mentioned by Dirk Benoit (undated) in an article on the website of Pavia Nursery. Labelled as *Q. rysophylla*, it was growing next to a tree of wild source that was correctly named, and very different in appearance. Initial observations on the tree suggested the male parent may have been *Q. falcata*. The original plant of 'Zehra' was raised from seed collected by Michael Frankis, probably from a plant cultivated at Yucca Do Nursery, but John Fairey has indicated that he did not have this species. The origin is therefore likely to be the same as the Rosemoor hybrid, which was also thought to be *Q. rysophylla* × *falcata*.

At Chevithorne Barton, Devon, England it was planted in 2006 and is 5.6 m tall. At Iturraran, Spain it was planted in 2008 has grown to 2 m. At Brive, France (Jean-Louis Hélardot) it was planted in very shallow soil in 2007 and is now 3 m tall. It did not suffer during the 2012 cold weather. It is also growing at the Plaček Quercetum in Kanin, Czech Republic where winter temperatures can be as low as -20 or -25 °C, sometimes as low as -29 (Chassé, 2013).

Summary

The loquat oak, *Quercus rysophylla,* receives praise from all that know it and I have received no negative comments. It seems to thrive almost everywhere it is grown from Western Europe to the southern and western USA, growing best in areas with warm summers. It is probably unlikely to survive extreme cold in central or northern Europe or central USA, although in these areas it is possible that hybrids with very hardy red oaks could produce plants with the ornamental characters of *Q. rysophylla*, such as the impressed veins and red young foliage. Where it grows well it can survive extremes of heat and cold, and a surprising amount of drought. No reports of disease or insect damage were received. It appears to need acidic soil and can be chlorotic on neutral or near-neutral soils in some areas, although in the case of *Q.* 'Maya' this may be due to the rootstock. Eike Jablonski suggested that more lime-tolerant rootstocks such as *Q. shumardii* or *Q. buckleyi* may help to solve this problem. The tallest tree in cultivation may be the one at Chocha, Ustaritz, France, said to be "20–25 m tall". Although this is in need of an accurate height measurement, its dbh, at 57.3 cm is slightly larger than that of the plant

image © Jan De Langhe

Foliage of *Quercus* 'Zehra' from Pavia Nurseries, Belgium.

at Hillier Gardens (55.9 cm) and the French tree is considerably younger. The tree with the largest diameter seems to be one grown from Hillier 622 in Reggio Emilia, Italy, at 63.7 cm. Although *Q. rysophylla* frequently produces hybrids when grown from garden seed it is interesting that reports from gardens where several trees grow together indicate that in these cases seed often comes true.

The fact that *Q. rysophylla* is not more widely planted or available can be put down to two main factors. Firstly *Q.* 'Maya' has been grown in its place and so *Q. rysophylla* has not frequently been grafted. Secondly, while numerous plants derived from introductions of Lynn Lowrey, Yucca Do Nursery and other collectors, now seed is less frequently available from Mexico. However, with *Q.* 'Maya' now recognized as hybrid and many plants of *Q. rysophylla* in cultivation it is hoped that this striking tree can be made more widely available.

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