Zeitschrift: Botanica Helvetica
Herausgeber: Schweizerische Botanische Gesellschaft
Band: 109 (1999)
Heft: 1

Artikel: A new nothospecies of the genus Quercus L. (Fagaceae)
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DOI: https://doi.org/10.5169/seals-73289

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Bot. Helv. 109 (1999): 91–96
0253-1453/99/010091-06 $ 1.50+0.20/0
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Botanica Helvetica

A new nothospecies of the genus *Quercus* L. (Fagaceae)

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Manuscript accepted December 28, 1998

Abstract

Alonso R., Llamas F., Puente E. and Penas A. 1999. A new nothospecies of the genus *Quercus* L. (Fagaceae). Bot. Helv. 109: 91–96.

A new nothospecies of the genus *Quercus* L., between *Q. faginea* Lam. and *Q. pauciradiata* A. Penas, F. Llamas, C. Pérez-Morales & C. Acedo, is described.

Key words: Quercus, nothospecies, trichomes, Spain.

Résumé

Un nouveau hybride entre *Quercus faginea* Lam. et *Q. pauciradiata* A. Penas, F. Llamas, C. Pérez-Morales & C. Acedo a été décrit.

Introduction

Quercus pauciradiata is a recently described species (Penas & al. 1997) of the NE of the province of León and N of Palencia (NW Spain). Within the area recorded for this taxon by the authors, and coinciding with the distribution area of the *Q. faginea* (we consider *Q. faginea* Lam. and *Q. broteroi* (Cout.) Rivas-Martínez as two different species) we have gathered materials that present intermediate characters between both taxa (Fig. 1). As already pointed out by Stebbins & Pérez de La Vega 1989 when speaking of the speciation model in *Quercus*, the formation of hybrids between perfectly characterized species is very easy in this group, even between very different species (evergreen with deciduous species). This formation of hybrids can be seen in some areas where the species live together, while in some others, although the species are sympatric there is no hybridation. The importance of the typology of the foliar trichomes in the identification of taxa in the genus *Quercus* has been employed by numerous authors (Sáenz de Rivas 1969, Sáenz de Rivas & Rivas-Martínez 1971, Hardin 1976, Olsson 1976, Penas & al. 1994, Llamas & al. 1995, Penas & al. 1997) and this has allowed us to describe this new hybrid of the genus *Quercus*. We have followed basically Hardin 1976 for the nomenclature of the trichomes.

Quercus* × *andresii*, *nothosp. nov. = *Q. faginea* × *pauciradiata*

Holotypus: Spain, León: Proximidades de Cistierna (30TUN2744), en sebe con restos de sauceda-fresneda, 980 m, 3-6-1998, leg. *R. Alonso* 4212, LEB 63255. (Fig. 2). **Isotypi:**

Figure 1. Distribution of *Quercus pauciradiata* in the province of León (stripped area) and localization of the *Q.* × *andresii* (star).

LEB 63262 and LEB 63263. **Paratypi:** Proximidades de Cistierna (30TUN2744), en lindero de quejigar, 980 m, 31-8-1997, leg. *R. Alonso* 4017, LEB 63439. Proximidades de Cistierna (30TUN2744), en sebe con restos de sauceda-fresneda, 980 m, 3-6-1998, leg. *R. Alonso* 4213, LEB 63256. Id. *R. Alonso* 4214, LEB 63257.

Diagnosis: *Intermedia inter parentales, mostrat in inferiore facie simul pilos fasciculatos-stipitatos proprios Querci pauciradiatae, et pilos multiradiatos et stellatos proprios Querci fagineae.*

Etymology: Dedicated to our friend and teacher Prof. Dr. Jaime Andrés.

Description: Medium tree, up to 10 m. Leaf subcoriaceous and marcescent, 1.5–11 × 0.9–7 cm, ovate, elliptical or obovate, most of them narrowing towards the apex, wider towards the middle or above. Leaf blade discolour, with the abaxial surface glaucous, covered by an indumentum constituted by short fasciculate-stipitate hairs of 2 to 4 (5) rays, characteristic of *Q. pauciradiata*, mixed with multiradiate and stellate hairs like *Q. faginea*; adaxial surface darker green, subglabrous, with a scarce indumentum of similar trichomes to those of the abaxial surface (Table 1). They have 5 to 10 pairs of secondary veins, and in some cases there are one or two pairs of sinual veins towards the base of the blade. Petiole 3 to 20 mm, subcilindrical or slightly grooved, covered by an indumentum more or less dense, formed by similar trichomes to those of the blade. The morphology of the leaves is quite variable, but always intermediate between both parentals (Table 2). Male catkins 5–9.5 cm long, with hairy

Figure 2. Leaved twig of *Quercus* × *andresii* from the holotypus.

Table 1. Trichome types present in the mature leaves of *Quercus* × *andresii* and their parentals: adaxial surface/abaxial surface: – = absent, (+) = rare, + = present.

	Simple uniseriate	Bulbous	Solitary	Fasciculate stipitate	Multiradiate	Stellate
Q. × *andresii*	–/+	+/–	+/+	+/+	+/+	(+)/(+)
Q. faginea	–/+	(+)/–	+/+	–/–	+/+	+/+
Q. pauciradiata	+/+	+/–	+/+	+/+	–/–	–/–

Table 2. Morphological characters of mature leaves of *Quercus* × *andresii* and their parentals.

	Texture	Duration	Shape	Lobes	Margin
Q. × *andresii*	subcoriaceous	marcescent	ovate, elliptical or obovate	acute to rounded	cleft
Q. faginea	subcoriaceous	marcescent	oblong to obovate	acute	dentate-serrate
Q. pauciradiata	herbaceous	deciduous	obovate	rounded	lobate to pinnatifid

raquis, and flowers with a perianth with hairy-ciliate lobes, narrowly oblong and acute apex, with 7–13 stamens by flower. Feminine flowers axilar, solitary or in glomerules, with subcampanulate perianth and with 3–4 short and erect styles, that finish in spathulate stigmas (sometimes bilobate), abruptly reflexed and arcuate. Acorns without or with a poorly developed achene, with cupule 4–6×5–14 mm, formed by hairy imbricate scales, the lower ovate-triangular, gibbous and adprese, the upper narrowly triangular and somewhat separate, all them gradually tappered in an obtuse point towards the apex.

Among the materials we have studied, there are specimens whose morphology is very similar to the parental *Q. pauciradiata*, but they have trichomes of both species in a higher or lower number. When there is a scarce percentage of trichomes of *Q. faginea* we suppose we are facing specimens belonging to generations subsequent to the F_1.

Q. × *andresii* (Fig. 3.1) differs from *Q. faginea* (Fig. 3.2) by the presence of fasciculate-stipitate hairs in the abaxial surface, and from *Q. pauciradiata* (Fig. 3.3) by the presence of multiradiate and stellate hairs. Furthermore from *Q.* × *welwitschii* Samp. (*Q. faginea* × *Q. pyrenaica*) by the fasciculate-stipitate hairs with long stipe (40-60 μm) and with 4 to 8 longer rays (500–1000 μm), while in *Q.* × *andresii* this type of trichomes have a short stipe (8–20 μm) and 2 to 4 (5) shorter rays (150–300 μm).

Pollen analysis: A stain with cotton blue in lactofenol (Maneval 1936) has been carried out, and we have observed up to 48% of not viable pollen grains, that morphologically are observed as empty, smaller and bad developed grains, that are stained in light blue. The viable pollen grains are observed as more deep blue, and they are of greater size and with cell contents.

Studied material of *Quercus faginea*: Spain, León: Ardoncino (30TTN80), 1-VIII-1982, leg. *M. E. García,* LEB 19708. Casasola de Rueda (30TUN11), en quejigar, 12-V-1987, leg. *J. Andrés*, LEB 44656. Cistierna, proximidades (30TUN2744), en quejigar, 980 m., 3-VI-

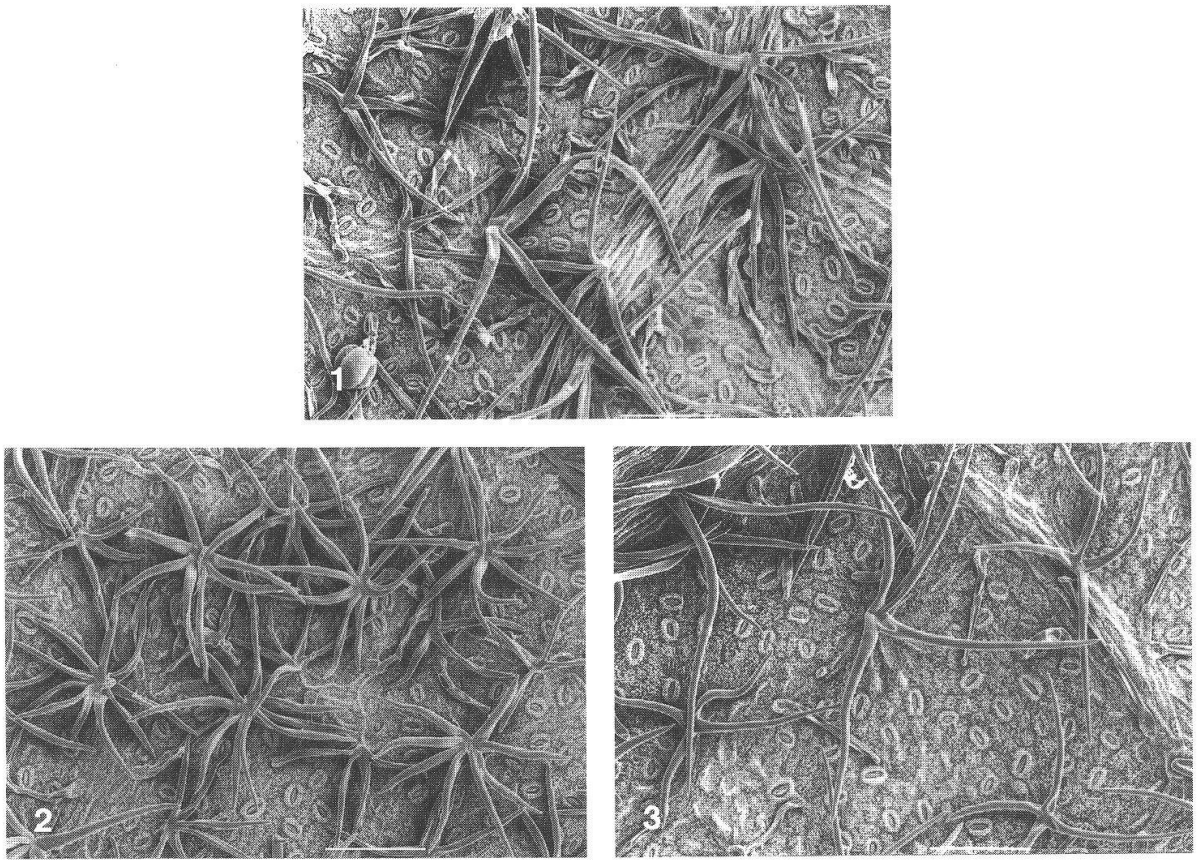

Figure 3. Trichomes on the abaxial surface of leaves: 1. *Quercus* × *andresii*. 2. *Q. faginea*. 3. *Q. pauciradiata*. (Scale bars = 100 µm).

1998, leg. *R. Alonso* 4213, LEB 63700. Crémenes (30TUN25), 11-VI-1972, leg. *J. Andrés*, LEB 43906. Cuadros (30TTN83), en bosque mixto con *Quercus faginea, Q. pyrenaica* y *Q. rotundifolia*, 21-VIII-1992, leg. *F. Llamas, C. Pérez-Morales & C. Acedo,* LEB 53149. Huergas de Gordón (30TTN8447), en quejigar con encinas, 7-X-1991, leg. *F. Llamas & C. Acedo,* LEB 53214. Jiménez de Jamuz (30TTM58), en encinar, 19-VI-1983, leg. *M. E. García,* LEB 19699. La Pola de Gordón (30TTN84), 10-VII-1983, leg. *J. Andrés*, LEB 42112. Las Majadas del Caserío (30TUN05), en bosque, 23-VI-1980, leg. *M. J. López*, LEB 16544. Lugán (30TUN03), en calizas, 5-VIII-1988, leg. *E. Puente & M. J. López*, LEB 48636. Mirantes de Luna (30TTN65), en suelos calizos muy degradados, 15-VII-1973, leg. *C. Romero*, LEB 122. Monte del Duque, Valderas (30TTM96), en pinar, 19-VI-1983, leg. *M. E. García,* LEB 19537. Pola de Gordón (30TTN84), 17-V-1986, leg. *M. E. García,* LEB 33036. Portilla de Luna (30TTN74), 1170 m, 18-X-1991, leg. *E. Puente & M. J. López*, LEB 53220. Quintana de La Peña (30TUN2939), en quejigar, 1100 m, 5-VIII-1995, leg. *R. Alonso* 1260, LEB 63694. San Miguel de Escalada (30TUN0915), 850 m, 29-IV-1991, leg. *E. Puente & M. J. López*, LEB 53221. Valverde Enrique (30TUM18), en quejigar, 12-V-1978, leg. *A. Penas*, LEB 48811. Valle de Nuestra Señora, Santa Olaja de la Varga (30TUN2846), en bosque mixto de quejigos, melojos y encinas, 1100 m, 3-VI-1998, leg. *R. Alonso* 4214, LEB 63697. Vega de Gordón (30TTN84), 10-VII-1983, leg. *C. Pérez-Morales*, LEB 25336.

Studied material of *Quercus pauciradiata*: Spain, León: Besande (30TUN4652), en brezal, 1280 m, 24-VII-1996, leg. *R. Alonso* 2616, LEB 63698. La Espina (30TUN4440),

en melojar, 1140 m, 19-VIII-1997, leg. *R. Alonso* 3854, LEB 63699. Llamas de Rueda (30TUN2622), turkey oak woodland on oligocene conglomerates, 920 m, 17-VI-1993, leg. *F. Llamas, C. Pérez-Morales & C. Acedo*, LEB 43002. Proximidades de Cistierna (30TUN2744), en sebe con restos de sauceda-fresneda, 980 m, 3-VI-1998, leg. *R. Alonso* 4212, LEB 63695.

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