***Quercus mediterranea* Unger 1847 (Fagaceae)**

Leaf description

- **morphology:**
  organisation: simple; **petiole:** leaves short- to moderately long-petiolate; **shape:** lamina usually 30–60 mm long, shape broad elliptic, obovate or ovate, marginally often a bit curled/involute; **leaf base:** base angle acute, at the very base obtuse; base shape convex, rounded to somewhat cordate, sometimes a bit asymmetrical; **leaf apex:** apex angle wide acute; apex shape convex, bluntly acute to acuminate at the very apex; **margin:** simple serrate at least in the upper half of the lamina, entire-margined in the lower part, teeth more or less regularly spaced, not dense, small, more or less conspicuous, acute to bristle-like; **1°-vein framework:** pinnate, midvein straight to bent, stout, apically sometimes sinuous; **2°-vein framework:** secondaries more or less parallel or diverging among each other, secondary spacing variable, craspedodromous, veins entering the marginal teeth, to weak brochidodromous, secondaries may fork once during their course across the lamina; **3°-vein framework:** tertiaries percurrent, densely spaced.
- **cuticle:** hypostomatic; cuticle of both surfaces delicate but due to sclerenchymatic epidermis remains on it appearing thick, adaxial cuticle glabrous, abaxial one with solitary, simple trichome bases; **adaxial cuticle:** anticlines straight to rounded, cell outlines polygonal, with continuous hypodermis; **abaxial cuticle:** anticlines straight, cell outlines polygonal, with continuous hypodermis, stomatal complexes cyclocytic, stomata elliptic to roundish, front cavity short, slender elliptic, polar T-pieces present; solitary simple trichome bases with uniserial trichomes.

Palecology

- **habitat:** mesophytic habitats
- **vegetation type:** broad-leaved deciduous to sclerophyllous forests
- **life form:** tree or shrub?
- **foliage persistence:** probably deciduous based on the delicate cuticle
- **flower ecology (pollination):** wind-pollinated (anemophilous)
- **fruit ecology (dispersal):** animal-dispersed (zoochorous)

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stratigraphy / occurence

- **stratigraphy:** Upper Lower Miocene to Pliocene
- **distribution:** In Middle Europe *Q. mediterranea* occurs in fossil plant assemblages in the late early to middle Miocene. In the late Miocene and Pliocene it is more common in Southern Europe (from Southern France to Greece). *Q. mediterranea* is also known from the Middle Miocene of Turkey.

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miscellaneous

- **synonyms:** –
- **modern relationship:** Most likely is a relationship to *Q. coccifera* L. (sect. *Cerris*) or different oak species of sect. *Ilex*.

- **remarks:** *Q. mediterranea* leaves appear coriaceous but their cuticles are thin and rarely preserved (e.g. Kvaček et al. 2002). Due to its leaf physiognomy, *Q. mediterranea* is considered to indicate strong seasonal changes in precipitation. Most recently this interpretation was questioned by Denk et al. (2017) who propose humid temperate climatic conditions based on possible close relatives that thrive in the Himalaya from Afghanistan to Nepal and in humide temperate regions of China today.

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30 macroscopic leaf traits are stored in *Digiphyll*

#	trait code	trait: charcters state
1	A-1.2	petiole: present
2	A-1.2.1	petiole, present: short
3	A-1.2.2	petiole, present: long
4	A-2.1	leaf organisation: simple
5	A-3.1	leaf shape: elliptic
6	A-3.2	leaf shape: obovate
7	A-3.3	leaf shape: ovate
8	A-4.2	leaf base angle: obtuse
9	A-5.1	leaf base shape: without basal extension
10	A-5.1.2	leaf base shape, without basal extension: rounded
11	A-5.1.4	leaf base shape, without basal extension: concavo-convex
12	A-5.2.1	leaf base shape, with basal extension: cordate
13	A-6.1	leaf apex angle: acute
14	A-6.2	leaf apex angle: obtuse
15	A-7.2	leaf apex shape: acuminate
16	A-7.7	leaf apex shape: convex
17	A-8.2	leaf margin: toothed
18	A-8.2.1	leaf margin, toothed: crenate
19	A-9.1.1	leaf teeth, order number of teeth: simple order (first order)
20	A-9.2.2	leaf teeth, tooth density: not dense
21	A-9.3.2	leaf teeth, tooth size: big
22	A-9.4.1	leaf teeth, tooth apex shape: acute
23	A-9.5.2	leaf teeth, tooth sinus shape: rounded
24	B-1.1	primary vein framework: pinnate
25	B-2.1	secondary vein framework: 2° veins reach margin
26	B-2.1.1	secondary vein framework, 2° veins reach margin: craspedodromous
27	B-2.3.2	secondary vein framework, 2° veins form loops and do not reach margin: weak brochidodromous
28	B-3.2	intramarginal vein: absent
29	B-4.2	intersecondaries: absent
30	B-5.1	tertiary vein framework: percurrent

For a detailed description of the leaf traits see menu *Manuals*.

? microscopic leaf traits are stored in *Digiphyll*

comming soon

Fossil images

References

- **Denk T., Velitzelos D., Güner T.H., Bouchal J.M., Grímsson F. & Grimm G.W. (2017):** Taxonomy and palaeoecology of two widespread western Eurasian Neogene sclerophyllous oak species: Quercus drymeja Unger and Q. mediterranea Unger. – *Review of Palaeobotany and Palynology*, 241: 98-128.
- **Kovar-Eder J., Kvaček Z. & Ströbitzer-Hermann M. (2004):** The Miocene Flora of Parschlug (Styria, Austria) - Revision and Synthesis. – *Annalen des Naturhistorischen Museums Wien*, 105 A: 45-159.
- **Kvaček Z., Velitzelos D. & Velitzelos E. (2002):** Late Miocene flora of Vegora, Macedonia, N-Greece. – *Korali Athens*: 175 p.
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