



Lectotypification of *Quercus brandisiana* Kurz and the significance of the leaf epidermal features to its taxonomy

QIANSHENG LI¹, MIN DENG^{2*}, QUANJIAN LI² & ALLEN COOMBES³

1. School of Ecology, Shanghai Institute of Technology, Shanghai, 201418, P.R. China

2. Shanghai Chenshan Plant Science Research Center, Chinese Academy of Sciences / Shanghai Chenshan Botanical Garden, Shanghai 201602, P.R. China

3. Herbarium and Botanic Garden, Benemerita Universidad Autónoma de Puebla, Puebla 72000, Mexico

*Author for correspondence: E-mail: dengmin@sibs.ac.cn

Abstract

Based on a survey of literature and specimens, the lectotype of *Quercus brandisiana* Kurz is designated here. Information on its distribution, taxonomy and leaf epidermal features is given. Features that distinguish *Q. brandisiana* from closely related species are given and a key to their identification is provided.

Key words: *Quercus*, taxonomy, typification, anatomy

Introduction

The name *Quercus brandisiana* Kurz (1873: 108) was validly published by Kurz (1873). The original publication recorded that this species was distributed in "Martaban", Burma. It was later transferred to the genus *Cyclobalanopsis* Oerst. (Schottky 1912), as *Cyclobalanopsis brandisiana* (Kurz) Schottky (1912: 657). Fan (1995: 50–51) created a later homonym in the genus *Cyclobalanopsis* by publishing the same combination. However, no type has been designated for this species in later taxonomic studies.

Based on the classification of Menitsky (1984), *Quercus brandisiana* was put into section *Helferiana* Menitsky (1984: 174–185), because of its "large, tufty, multicellular hairs with distinct stalk; acorns discoidal, hemispherical or less often short-cylindrical". *Q. brandisiana* was put into subsection *Subpedicellatae* A. Camus, because it only has 3(4) styles, conical cupules and almost globose acorns. The species in section *Helferiana* with 4–7(8) styles were put into subsection *Helferiana* A. Camus, characterized by the saucer-shaped cupule and subglobose acorns. King (1889: 31) noted that *Q. brandisiana* was close to *Q. mespilifolia* Wall. ex A. DC. [which was regarded as synonym of *Q. kerrii* Craib by Menitsky (1984: 177) and Govaerts and Frodin (1998: 263)], and *Q. helferiana* A. DC. The fasciculate trichomes on the abaxial leaf surface, the wavy, coarsely sinuate leaf margins, and irregularly spaced secondary veins of *Q. brandisiana* were consistent with the species in section *Helferiana*, especially *Q. helferiana* and *Q. kerrii* Craib, and the distributions of these three species are sympatric. The resulting taxonomic confusion meant that there can be problems in the identification of herbarium materials of *Q. brandisiana* and its affinities when there are no acorns present.

Specimens of *Quercus brandisiana* and other oak species collected from Vietnam, Laos and Malaysia in the main herbaria were studied to choose the lectotype for this name. Its leaf epidermal features are reported and compared with previous leaf epidermal studies in species of section *Helferiana* in *Quercus* subgenus *Cyclobalanopsis*, in order to provide informative diagnostic features and clarify the taxonomic confusion of these species.

s.n.)". However, this specimen was not traced in this study. The distribution in Vietnam and Malaysia (Govaerts and Frodin 1998; Kew database, World Checklist of Selected Plant Families [<http://apps.kew.org/wcsp/home.do>]) may be suspect as this species is not recorded in local floristic works. The possible distribution of *Q. brandisiana* in Vietnam and Malaysia needs further study.

According to Menitsky (1984), *Quercus brandisiana* was put into section *Helferiana*. Based on Deng's (2007) study on leaf epidermal features of other species in this section (*Q. austrocochinchinensis*, *Q. kerrii*, *Q. helferiana* and *Q. rex*), the trichome types and stomata types are consistent, with only fasciculate and uniseriate trichomes. However, unlike *Q. brandisiana* with the small and flat trichome base and 3–4 styles on the pistillate flowers, the other four species all have typical compound trichome bases which form a prominent dark-stained pedestal structure and have (4)5–8 styles on the pistillate flowers. These leaf epidermal differences partly supported Menitsky's (1984) two subsections in section *Helferiana*. The leaf shape and leaf margin type of *Q. brandisiana* are similar to those of *Q. kerrii* and *Q. helferiana*, the prominent trichome base features and convex thickenings on epidermal cells in *Q. brandisiana* offer excellent diagnostic features for identification of the species. *Q. kerrii* differs from *Q. helferiana* in its deciduous fasciculate trichomes, with only a few persisting close to the main veins on the abaxial surface of mature leaves. Mature leaves of *Q. helferiana* have persistent fasciculate trichomes.

Key to *Quercus brandisiana* and its closely related species based on leaf epidermal and venation features

1. Abaxial leaf surface with fasciculate trichomes, which have a typical compound trichome base forming a pedestal structure above the ordinary leaf epidermal cells; the leaf epidermal cells flat or with indistinct thickening; leaf margin serrate on the apical 2/3, the secondary veins branching once before reaching the teeth, the slender secondary vein branch entering the teeth, the thick branch curving and joining the upper secondary vein 2
1. Abaxial leaf surface with fasciculate trichomes, which have a single-celled, flat trichome base not forming a pedestal structure, the leaf epidermal cells with rounded thickenings, leaf margin entire or with inconspicuous teeth on the apical 1/2, the secondary veins directly entering the teeth *Q. brandisiana* Kurz
2. Stipitate fasciculate trichomes on the abaxial leaf surface persistent in mature leaves *Q. helferiana* A.DC.
2. Stipitate fasciculate trichomes on the abaxial leaf surface deciduous, mature leaves glabrous *Q. kerrii* Craib.

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