



Reinstatement of *Quercus tungmaiensis* Y.T. Chang (Fagaceae) and supplementation of its anatomic features

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Abstract

Leaf architecture and epidermis features are useful to reveal the taxonomic identities of species in *Quercus* s.l.. For many years different opinions have existed on the taxonomic status of *Quercus tungmaiensis*, either as a synonym of *Q. lanata* or as an independent species. In this study, we compared the leaf epidermal features, leaf architecture and other morphological features of *Q. tungmaiensis* and *Q. lanata*. Our results revealed that the dense persistent stellate trichomes with a compound trichome base, uniseriate trichomes on the abaxial leaf surface, blunt-tipped teeth and well developed areoles formed by the 5° veins, in *Q. lanata* were different to the glabrous abaxial leaf surface, spine-tipped teeth and areoles formed by the 4° veins of *Q. tungmaiensis*. Therefore, the name *Q. tungmaiensis* should be reinstated. Its systematic placement in section *Ilex* was further discussed. A key to *Q. tungmaiensis* and other common evergreen oaks of section *Ilex* in East Asia was provided.

Key words: Leaf anatomy, *Quercus* “Ilex Group”, taxonomy

1. Introduction

Quercus tungmaiensis Y. T. Chang (1966: 254) was described as being endemic to SE Tibet. Later, it was regarded as a synonym of *Q. lanata* Smith (1814: n.º 27) by Zhou *et al.* (1995a: 148) because of the existence of a range of apparent intermediates. Zhou & Sun (1996) eventually reduced *Q. tungmaiensis* and *Q. leucotrichophora* A. Camus (1935: 66) to synonyms of *Q. lanata*. However, the species status of *Q. tungmaiensis* was accepted by Huang *et al.* (1998) in *Flora Reipublicae Popularis Sinicae* (Chinese version). *Flora of China* (Huang *et al.* 1999) accepted Zhou & Sun (1996)’s treatment and listed *Q. tungmaiensis* as a synonym of *Q. lanata*, which is native to southern slopes of the Himalaya. Recently, an oak originating from Tibet and growing in the collection at Chevithorne Barton, UK (tentatively listed as *Q. lanata*) was finally identified as *Q. tungmaiensis* by one of us (AC). Coombes & Zhou (2009) briefly compared the leaf shape, texture and trichomes of *Q. lanata* and the cultivated *Q. tungmaiensis*, suggesting the two species are distinct, but no further work on the anatomic features was done, and no formal taxonomic treatment on the two names was included. During the preparation of *Flora of Pan-Himalaya* (Fagaceae), we noticed the problems with the two names. We studied the protologues of the two species, which also showed great differences. The protologue of *Q. tungmaiensis* states (translated): “the twigs covered by yellow stellate hairs, later glabrous and the branch color changing to dark purple. Leaf texture thin coriaceous. The adaxial side glabrous, abaxial side with scattered stellate trichomes when young, but glabrous when mature.” In contrast, the protologue of *Q. lanata* states “woolly-leaved Nepaul Oak. Leaves coriaceous, densely woolly beneath” (Rees 1814). All these features are also shown in the type specimens of the two species (see Figs. 1 & 2), indicating great differences.

Leaf architecture and leaf epidermal features are useful in revealing species identity and their systematic placement in oaks (Zhou *et al.* 1995b, Luo & Zhou 2001, 2002, Deng *et al.* 2014). But these important taxonomic features were never recorded for *Q. tungmaiensis* and *Q. lanata*. In this study, we examined the type materials, herbarium specimens in major herbaria of the two species, and the leaf epidermal and leaf architecture features of specimens from different