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Rediscovery of *Quercus aliena* Blume (Fagaceae) in Taiwan

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ABSTRACT: The first collection of *Quercus aliena* Blume var. *acutiserrata* Maxim. *ex* Wenz. in Taiwan was made by Y. Shimada in 1924 from Hongmao. Since then, no other specimen had ever been collected. Recently, this species was rediscovered from Fengshan (3 km south of Hongmao) in Hsinchu County. On closer studies it was found to be the typical variety of *Q. aliena* Blume rather than the name recognized by Shimada. The population of *Q. aliena* is quite small at that limited location, and is vulnerable to human impacts. Therefore, it is necessary to take steps to conserve the habitat as soon as possible. The taxonomic treatment, morphological descriptions, photographs and notes of the species are given here. A key to distinguish it from the other three closely related Taiwanese species is also provided.

KEY WORDS: ***Quercus aliena*, Description, Distribution, Flora of Taiwan, Rare species, Taxonomy.**

INTRODUCTION

On Sept. 22, 1924, Yaichi Shimada, a Japanese forester, collected a specimen of Fagaceae from Hongmao, Hsinchu. The specimen was identified as "*Quercus aliena* Bl. var. *acute-dentata* Maximowicz" on the label. Although it was a new record to Taiwan, Shimada never reported his discovery in any paper.

Six years later, another Japanese forester, Syuniti Sasaki, adopted the name "*Quercus aliena* Blume var. *acuteserrata* Maximowicz" when he published a catalogue of the specimens presented in the Herbarium of the Department of Forestry, Government Research Institute, Formosa (Sasaki, 1930). Since then, the name has been used by all botanists (Kanehira, 1936; Liu, 1962; Liu, 1968; Liu & Liao, 1976; Shen, 1984; Liao, 1991, 1996; Yang *et al*., 1997) for over 70 years. Despite numerous explorations in the Hsinchu area, additional specimens had never been found. For this reason, Kanehira (1936) thought that it might be introduced, and Shen (1984) thought it had been extinct from Taiwan.

In the course of floristic inventory in Hsinchu on Oct. 14, 2002, the fourth and fifth authors found a wild population considered to be the same species as that collected by Shimada. This plant was finally identified as *Quercus aliena* Blume according to the original descriptions by Blume (1850) and Wenzig (1886), and the key and description in Huang *et al*. (1998). This identification was further confirmed by comparing with Chinese and Japanese specimens deposited at the Herbarium of the Department of Botany, National Taiwan University (TAI) and the Herbarium of the Taiwan Forestry Research Institute (TAIF).

In the present paper, nomenclature, descriptions, and notes are given. In addition, a key is provided to distinguish it from the other three closely related Taiwanese species. The materials collected by the authors are preserved in the TAI Herbarium of National Taiwan University.

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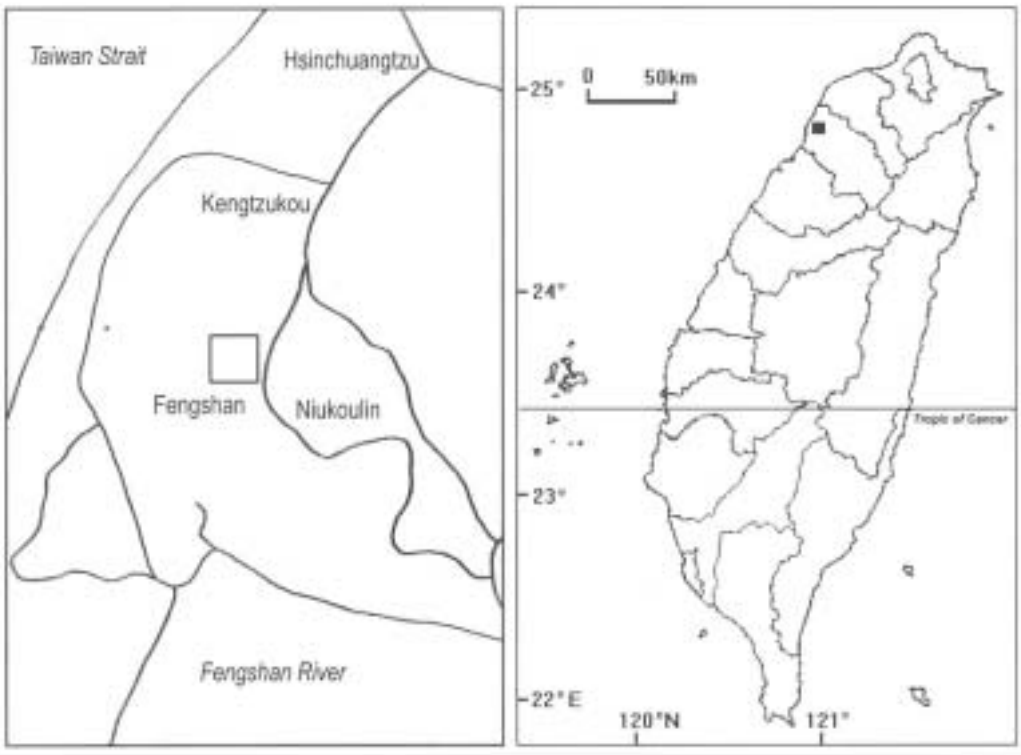

Fig. 1. Locality at which specimens were collected (left: square; right: solid square). Source of the left map is from Combined Service Forces, 1989.

TAXONOMIC TREATMENT

Quercus aliena Blume, Mus. Bot. Lugd. -Bat. 1: 298. 1850; Chun, Chinese Econ. Trees 97. 1921; Huang *et al.*, Fl. Reipubl. Popularis Sin. 22: 230. 1998. Figs. 1-4

Quercus aliena Blume var. *acutiserrata auct. non* Maximowicz *ex* Wenzig: Kanahira, Form. Trees. 119. 1936; Liu, Illu. Nat. Intro. Lig. Pl. Taiwan. 614. 1962; Liu, Bull. Taiwan For. Res. Inst. 165:10. 1968; Liu & Liao, Fl. Taiwan 2: 98. 1976; Shen, Studies Taxon. Taiwan Fagaceae Pollen Morph. 49. 1984; Liao, Taxon. Rev. Fam. Fagaceae Taiwan. 165. 1991; Liao, Fl. Taiwan 2: 114. 1996. 2nd ed.; Yang *et al.*, Man. Taiwan Vasc. Pl. 2:35. 1997.

Deciduous trees to 10 m high, trunks 0.3 m across; bark rigid, irregularly furrowed, gray; branchlets grayish brown, glabrescent, lenticellate; buds ellipsoid, scales brown, ciliate. Leaves coriaceous, elliptic-obovate to obovate, 10-25 cm long, 5-14 cm wide, the apex obtuse to acuminate, the base cuneate to rounded, dentate, deeply green, glabrous above, grayish-white, densely stellate-hairy beneath, lateral veins 9-15-paired; petioles 0.5-2 cm long, glabrous. Inflorescences catkins or spikes, coetaneous in spring, borne on leafy flowering branchlets. Staminate catkins pendulous, 4-8 cm long; staminate perianth 6-lobed, the lobes linear; stamens 7-10. Pistillate flowers axillary, cupules solitary or in fascicles of 2 or 3, 2-3 mm long, 2-2.8 mm broad; imperfect ovary 2-4-celled, styles 2-4, bracts ovate-lanceolate, 2 mm long, crowded, grayish pubescent. Cupules cupulate, 0.5 cm high, 1.5 cm broad, enclosing ca. 1/3 of nut, covered with small triangular imbricate scales. Nuts ellipsoid to ovoid, about 1.5-2 cm long, 1-1.5 cm broad, hairy becoming glabrate, scar slightly raised, maturing from Sept. to Nov.

Fig. 2. Specimen newly collected (*Wu 2638*).

Distribution: China, Japan and Korea. Taiwan, found only at Fengshan near Niukoulin, Hsinchu County. N24°52'53", E120°57'43" (E246150, N2752650 in TWD67). Elevation is about 100 m.

Notes: The rediscovery of *Q. aliena* at Fengshan is not surprising since the place is near Hongmao where Shimada collected his specimen in 1924. Although specimen of this species was originally identified as *Q. aliena* var. *acutiserrata* rather than *Q. aliena* var. *aliena*, the two are easy to distinguish. The leaf margin of var. *aliena* is coarsely dentate-sinuate, and the apices of teeth are obtuse or rounded. This is in contrast to the margin of var. *acutiserrata* that is coarsely serrate with apices of serrations acuminate or acute.

In Taiwan, trees of *Q. aliena* form a mixed association with *Q. variabilis* Blume. It grows only on the windward slopes (against the winter monsoon). The trees are windswept and stunted, and are quite low (usually less than 10 m tall) as compared to those reported elsewhere in China (Liu & Liao, 1976; Huang *et al*., 1998) and Japan (Satake *et al*., 1989).

The population of *Q. aliena* is quite small (about 100-200 individuals) at that limited location, and is vulnerable to human impacts. Unless steps are taken to conserve the habitat soon, it will be in danger of extinction in Taiwan.

Specimens examined: Taiwan: Hsinchu Co., Hongmao, *Shimada s. n.* Sep. 22, 1924 (TAIF); Fengshan near Niukoulin, *Yang s. n.* Oct. 14, 2002; *Wu 2638*, Oct. 28, 2002. Taipei City, Taipei Botanical Garden, *Chen 193* (TAIF, introduced). **China:** Kwangtung Prov., *Tsang 20681* (TAI); Chekiang Prov., *Law 1267* (TAI); *Ching 2554* (TAI); Szechuan Prov., *Wang 21749* (TAI); Hopei Prov., *Chow 40505* (TAI); Kiangsi Prov., *Cheo 218* (TAI). **Japan:** Yamashiro, *Makino. s. n.* (TAIF); *Nakashima s. n.* (TAI). **USA:** Harvard Univ., *Davis et al. 80-275* (TAIF, introduced from China).

Fig. 3. Fresh leaves and fruits of *Q. aliena*.

Fig. 4. Habitat (trees of *Q. aliena* pointed out by arrows).

Key to Taiwanese species closely related to *Q. aliena*

1. Scales of cupule subulate, linear or narrow lanceolate, vary long and spreading.
   2. Leaf blade narrowly elliptic-lanceolate to ovate-lanceolate, margins spiniform dentate; scales of cupule subulate or linear, often reflexed ……..…… *Q. variabilis*
   2. Leaf blade obovate to narrowly obovate, margins undulate to rough dentate; scales of cupule narrowly lanceolate, erect or reflexed ……..... *Q. dentata*
1. Scales of cupule triangular, very short and adnate.
   3. Leaf margins glandular ……... *Q. glandulifera var. brevipetiolata*
   3. Leaf margins not glandular ……...…….. *Q. aliena*

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槲櫟(殼斗科)在臺灣的再發現

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摘　　要

臺灣植物誌中所記載的孛孛櫟（*Quercus aliena* Blume var. *acutiserrata* Maxim. *ex* Wenz.）是 1924 年由島田彌市首次於新竹縣紅毛所採集的標本，此後一直未曾有過野外的採集紀錄。2002 年我們於紅毛南方 3 公里靠近牛牯嶺的鳳山地區再度找到該種殼斗科植物。然而，在觀察比較島田彌市及本次採集標本的形態特徵之後，我們認為這種植物應該是槲櫟 (*Q. aliena* Blume) 而非孛孛櫟。本文詳細描述該種植物，指明槲櫟及孛孛櫟之差異點，並提供台灣相關種類之檢索表。槲櫟目前已知的族群量很小，且生育地曾遭受人為的嚴重干擾。由於干擾的壓力目前仍然存在，所以我們建議有關單位應該儘速採取棲地保護的措施。

關鍵詞：槲櫟、特徵描述、分佈、臺灣植物誌、稀有種、分類。

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