

東海地方と関東地方に分布するユニークな落葉性ナラに関する新種名の提案

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Shozo Hiroki: A new scientific name proposed for a unique deciduous *Quercus* in Chubu and Kanto districts, Japan

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Populations of a *Quercus* species previously identified as *Q. mongolica* Fischer (Ohwi 1953) occur on dry ridges or in habitats with thin and poor soils in Japan's Tokai District (Hiroki 1982, 2001, Matsuse and Hiroki 2009). This *Quercus* species was recognized as a member of the Tokai hilly land element (Ueda 1989), but Kunihiro Ueda of Kanazawa University has questioned its taxonomic position (Ueda, pers. comm. 1999); the leaf margins of these trees have obtuse to acute lobes, whereas those of *Q. mongolica* are dentate. Ohba (2006) classified these plants as *Quercus serrata* Murray subsp. *mongolicoides* H. Ohba. However, the leaf morphology is quite different from that of *Q. serrata* Murray and more similar to that of *Quercus crispula* Blume (Suda and Hoshino 2008, Mochizuki et al. 2013). In addition, the basis for Ohba's classification is incorrect: Ohba (2006) wrote, "Kanno et al. (2004) revealed the genetically close relationship [of *Q. serrata* subsp. *mongolicoides*] with *Q. serrata*;" however, Kanno et al. (2004) treated four *Quercus* species (*Q. serrata*, *Q. crispula*, *Q. dentata* Thunb., and *Q. aliena* Blume), but not this subspecies.

Serizawa (2008) considered the subspecies to be a variety of *Q. crispula*. But between the plants concerned and *Q. crispula* there are differences in the leaf and acorn forms, and in the cupule, which shows a remarkable humped form of scales in the former (Suda and Hoshino 2008). Moreover, the main root of the subspecies elongates obliquely but that of *Q. crispula* does so vertically (Hiroki et al. 2001, Hiroki 2013b).

Here, I propose a new species name—*Quercus mongolicoides* (H. Ohba) Hiroki, stat. nov.—for

the plants with new evidence of its root elongation habit.

***Quercus mongolicoides* (H. Ohba) Hiroki, stat. nov.**

≡*Quercus serrata* Murray subsp. *mongolicoides* H. Ohba, in K. Iwats. et al., Fl. Jap. 2a: 49 (2006). —Type: Aichi, Seto-shi, Kaisho, 35°10.93'N, 137°06.78'E, 130m, T. Miyazaki 512004 (TI!).

≡*Q. crispula* Blume var. *mongolicoides* (H. Ohba) Seriz., Shidekobushi 1: 55 (2008).

–*Q. mongolica* auct. non Fisch. ex Turcz. Ohwi (1953).

Deciduous trees, trunk to 18 m tall, to 50 cm in diam.; bark deeply fissured longitudinally; present year's branchlets pale green grayish, with rounded lenticels. Winter buds narrowly ovoid, 5–9 mm long, with ca. 30 brown scales. Leaves sessile or shortly petiolate, with short hairs ca. 1 mm in length on both side of leaves, particularly luxurious on surface midribs, later glabrescent; laminae obovate to spatulate, 10–20 cm long, 6–14 cm wide, apex rounded with an apiculate tip, base narrowly cuneate, margin dentate with lobes obtuse (sometimes acute), or crenate with the lobes rounded or rarely angular; nerves 13–16 pairs. Flowers early to late April, coetaneous with leaves. Staminate inflorescences from axils of leaves on basipetal part of present year's branchlets, ca. 6–8 cm long, yellowish green. Carpellate inflorescences axillary on the acropetal part of present year's branchlets, with 2 flowers. Staminate flowers pale green, perianth membranaceous, cleft into c. 7 linear lobes; stamens 8–10 exerted, anthers pale yellowish green before dehiscence. Carpel-

late flowers nearly sessile; styles 3, reddish, bent outward.

Cupules 21–32 mm in diameter, 13–16 mm high, the mouth slightly narrowed; scales densely imbricate, prominently humped from the middle to the lower part. Acorns ellipsoid, slightly narrowing to the apex, 17–25 mm long, 13–18 mm in diameter, apex truncate (narrowly or sometimes broadly) or almost rounded, ripening in first year. The main roots of seedlings elongated with an oblique angle to the vertical ($>20^\circ$ under experimental conditions; Hiroki 2013b).

Japanese name. Fumoto-mizunara

Distribution. Japan, endemic: Kanto Distr. (Tochigi and Gunma Pref.), Chubu Distr. (Nagano, Aichi, Gifu Pref.). The distribution is roughly shown in Fig. 1.

Other specimens examined. **Kanto Distr.** Tochigi Pref.: Ashikaga. S, Akiyama 162732 TNS. —Gunma Pref.: Kiryu, Azumayama. D, Suda 49054, 49055 SMNH. **Chubu Distr.** Aichi: Toyota, Fujioka. S, Akiyama 284029 TNS. Nagakute. S, Akiyama 765924 TNS. Shinshiro. S, Akiyama 280398 TNS. Gifu: Mizu-

nami, Hiyoshi-cho. S, Akiyama 331975, 332028, 337547, 337654 TNS. Mizunami, Ookute. S, Akiyama 960477, 960478, 987912 TNS. Nagano: Iida, Igara (and Ochi-mura, Suishouzan, Takesa). A, Hiruma 1512, 1896, 2397, 2564, 2897, 6852 ICM.

(SMNH = Saitama Museum of Natural History, TNS = National Museum of Nature and Science, ICM = Iida City Museum)

Notes.

Quercus serrata shows large differences from *Q. mongolicoides* in leaf morphology: the latter has almost sessile petioles in contrast to the former's rather longer petioles, and leaves of the former shows concaveness between the lobes which have cuspidate apex, unlike that of the latter. The acorn and cupule morphology also show differences between the species. Considering the DNA distance between the species (Mochizuki et al. 2013) and the above morphological differences, placement of *Q. mongolicoides* as a subspecies of *Q. serrata* is untenable. The reason for that placement by Ohba (2006) in reference to Kanno et al. (2004) appears to



Fig. 1. Distribution map of *Quercus mongolicoides*

have been a mistake, as described in the leading paragraph.

Mochizuki et al. (2013) examined the DNA of *Q. crispula* and *Q. mongolicoides* on Mt. Takahara, in the Kanto District, and found little difference between the two. They suggested therefore that the two taxa should be treated as varieties of the same species. However, it is well known that *Quercus* species frequently hybridize with each other, particularly within the same section (Stebbins 1950, Burger 1975, Valen 1976). So it is necessary to reexamine their data along with those of the populations in the Tokai District, the main distribution area of *Q. mongolicoides*.

Leaves of some individuals of *Q. mongolicoides* found in the Tokai District resemble those of *Q. crispula* in having acute, not dentate, lobes. However, the remarkable humped scales of the cupules distinguish those individuals from *Q. crispula*.

Ohba (2006) treated the *Quercus* populations in the northern Kanto District as being in the same taxonomic group as *Q. serrata* subsp. *mongolicoides* in the Tokai District. Serizawa (2008) doubted this, considering that the two populations might be derived independently from *Q. crispula* in each area, but the leaf and cupule forms of both populations are similar (Suda and Hoshino 2008), and the main-root elongation habit of the northern Kanto population (in Kamikoike town, Tochigi Pref.) is similar to that of the Tokai population (Hiroki 2013b). So it seems reasonable to treat them as the same taxon. A unique habit such as the oblique root elongation of *Q. mongolicoides* is unlikely to have been acquired independently in different districts. It is therefore possible that this disjunct distribution was caused by the extinction of intervening populations, with the exception of populations in Iida, in Nagano Pref.

Quercus mongolicoides is distributed within the range of 100 to 700 m elevation in the Tokai District, and occurs within the same range in the Kanto District and Nagano Pref., occupying lower elevations than *Quercus crispula*, and mostly forming secondary forests. *Quercus mongolicoides* generally occurs on ridges, on shal-

low soils of the sand and gravel sediments of the Mio-Pliocene Tokai Group, and in denuded areas of granite in the Tokai District (Hiroki 2013a). The oblique elongation of the roots may be an adaptation to growing in such soils, which can be nutrient-poor and dry (Hiroki 2013b).

Suspected hybrids exist between *Q. mongolicoides* and *Q. crispula* at about 700 m on a slope of Kasagiya, Gifu Prefecture, where both species grow in close proximity.

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- の痩せ地に生育する *Quercus* の1種を、コナラの垂種として *Quercus serrata* Murray subsp. *mongolicoides* H. Ohba (フモトミズナラ) と名付けた。しかし、このフモトミズナラの葉や殻斗の形態はミズナラに類似する傾向を示し、芹沢 (2008) はミズナラの変種 *Q. crispula* Blume var. *mongolicoides* (H. Ohba) Seriz. と位置づけた。しかしながら、フモトミズナラにおける殻斗の鱗片の隆起はミズナラよりも著しく、葉縁はより鈍頭なものが多くミズナラとの違いも認められる。フモトミズナラは根を斜めに伸長する性質を有しており、根を鉛直方向に伸長するミズナラとは明らかに異なる。これらのことから、フモトミズナラを独立した種として位置づけ、*Quercus mongolicoides* (H. Ohba) Hiroki と命名することを提案した。葉、堅果および殻斗の形態、さらに実生の根が斜行することを記載した。関東に分布する個体群と東海地方の個体群葉は葉と殻斗の形態が類似し、両者とも根を斜めに伸長することから、両者は同一の分類群であると判断した。

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広木詔三：東海地方と関東地方に分布するユニークな落葉性ナラに関する新種名の提案

大場 (Ohba 2006) は、従来モンゴリナラ (*Quercus mongolica*) と呼ばれていた東海地方