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Two newly recorded species of *Acer* (Aceraceae) in China

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Abstract *Acer calcaratum* and *A. acuminatum*, two poorly known and very rare species, occurring in Southeast Asia and the Himalayas respectively, were discovered recently in Yunnan Province and Xizang Autonomous Region (Tibet) in China. *Acer calcaratum* belongs to sect. *Palmata* ser. *Sinensia*, and is characterized by its 3 basally-nerved and 3-lobed leaves, with a rounded base, short, corymbose inflorescence and with few fruits, usually with only one large, well-developed samara, the nutlet more or less ovoid. *Acer acuminatum* belongs to sect. *Arguta*, and is characterized by its 3- or 5-lobed leaf blade, the lateral lobes usually as long as central lobe, apex of the lateral lobes caudate-acuminate, and infructescence 12–20 cm long.
Key words *Acer*, *Acer calcaratum*, *Acer acuminatum*, Aceraceae, new record, China.

Acer L. (Aceraceae), containing at least 140 species, is the largest genus of broad-leaved deciduous trees that dominate the broad-leaved deciduous forests of the Northern Hemisphere today (Wolfe & Tanai, 1987). With about 75 percent of the total number of species, China is the modern biodiversity center of the genus. During the course of preparing the draft of Aceraceae for the *Flora of China*, two new records were found and are reported here.

1. Acer calcaratum Gagnep. in Notul. Syst. Paris 13: 192. 1948. Type: Vietnam. Annam, Nhatrang, alt. 1000–1500 m, *A. Chevalier 38878* (holotype, P, photo seen).

A. isolobum Kurz in J. Asiat. Soc. Bengal Pt. 2, Nat. Hist. 41: 304. 1872, non Masslalongo (1859). Type: Myanmar. Pegu, *A. Kurz 1365* (lectotype designated by Murray in 1978, K!; isotype, P).

A. wilsonii Rehder ssp. *burmense* A. E. Murray in Kalmia 8: 20. 1978. Type: Myanmar. Pegu, *A. Kurz 1365* (holotype, K!; isotype, P).

A. craibianum Delendick in Brittonia 30 (4): 474. 1978. Type: Myanmar. Pegu, *A. Kurz 1365* (holotype, K!; isotype, P).

三裂枫 新拟

Small trees to 7 m tall, andromonoecious. Branchlets smooth, green and glabrous, greenish brown or olive-brown in their second year; winter buds ovoid, 4-paired. Leaves chartaceous, deciduous; petioles 1.5–4.6 cm, glabrous; blade 6–15×5–21 cm, deeply 3-lobed, base rounded, rarely subcordate, adaxially olive green, abaxially light green, and glabrous with exception of axillary tufts of pale hairs, tertiary venation reticulate; lobes triangular-ovate, margin entire, apex acuminate; main nerves 3, developing from leaf base, main nerves and veinlets distinct on both surfaces. Inflorescence corymbose, terminal on a two-leaved branchlet. Flowers with pedicels glabrous, 1.7–2 cm long; sepals 5, purplish red; petals 5, white; stamens 8; disc glabrous, extrastaminal; styles 2. Samaras glabrous; nutlets brown, ovoid, ca. 5×7 mm, distinctly veined; wings spreading obtusely, 4–6 cm long with nutlets 1.4–1.7 cm wide, reddish when young, brownish when mature. Fl. Nov.–Jan., fr. Mar.–Jul.

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China. Yunnan (云南): Jinghong (景洪), Menglong (勐龙), Mengsong (勐宋), in rain forest, alt. 1700 m, 1998-04, H. Wang (王洪) 6215 (PE).

Thailand. **Loei:** Mt. Phu Krading, C. F. van Beusekom & C. Phengklai 3145 (K); Phukrading, L. B. Abbe et al. 9453 (K); Poo Kradeng, F. Flot 7505 (K). **Chiangmai**: Doi Khun Huai Pong, B. Hansen & T. Smitinand 12861 (K).

Distribution: China (Yunnan), Myanmar, Thailand, Vietnam. Scattered near streams in the rain forest at elevations between alt. 1200 to 2400 m.

Acer calcaratum is a poorly known species distributed in Myanmar, Thailand and Vietnam (Shimizu et al., 1981; Santisuk, 1998). Gagnepain (1948) described this species based on *A. Chevalier 38878* (P) from Vietnam and noted that it is easily confused with *A. isolobum* Kurz and *A. tonkinense* Lecomte. *Acer isolobum* was described from Myanmar and is in fact a later homonym of *A. isolobum* Masslalongo (Murray, 1978; Delendick, 1978; van Gelderen, 1994). Murray (1978) and Delendick (1978) provided two new names for *A. isolobum* Kurz respectively: *A. wilsonii* Rehder ssp. *burmense* A. E. Murray and *A. craibianum* Delendick, but these two taxa are in fact synonyms of *Acer calcaratum* (Shimizu et al., 1981).

The 3-lobed leaf shape of *Acer calcaratum* is somewhat similar to that of *A. wilsonii* Rehder, *A. tonkinense*, *A. fenzelianum* Hand.-Mazz., *A. osmastoni* Gamble, and *A. chapaense* Gagnep. *Acer calcaratum* differs from *A. wilsonii* by its short corymbose inflorescences, sepals purplish red, samaras much larger and usually with only one well-developed in each inflorescence, while *A. wilsonii* is characterized by its long drooping paniculate inflorescences, sepals greenish yellow, samaras much smaller and numerous (Santisuk, 1998), and leaves occasionally with two additional basal lobes (van Gelderen, 1994).

Murray (1970) treated *A. calcaratum* as a synonym of *A. tonkinense* ssp. *fenzelianum* (Hand.-Mazz.) E. Murray, but more recently *Acer calcaratum*, *A. tonkinense*, and *A. fenzelianum* have all been treated as good species (Shimizu et al., 1981). Valder (1975) once mistook a tree of *A. calcaratum* from Thailand as *A. tonkinense* because of its 3-lobed leaves (Shimizu et al., 1981). *Acer tonkinense* is characterized by its long paniculate inflorescences and leaves being ovate, shallowly 3-lobed or sometimes with two additional basal lobes, the base usually cordate, petioles stout, 2–2.5 cm long, glabrous, samaras small, 3–3.5 cm long, glabrous. *Acer fenzelianum* is characterized by its leaves being oblong, 10–13×6–10 cm, very shallowly 3-lobed, lateral lobes smaller and slightly divergent, base obtuse, petioles stout, 2–3 cm long, tomentose, inflorescences corymbose, pedicels tomentose, and samaras pubescent, 3.5–3.8 cm long.

Acer osmastoni Gamble was described from the Sikkim Himalayas in India, it differs from *A. calcaratum* by its paniculate inflorescence, leaves being sometimes unlobed, and samaras smaller. Van Gelderen's (1994) treatment of this taxon as a synonym of *A. calcaratum* is not accepted here.

Acer chapaense was described from northern Vietnam based on *Pételot 5824* (P). Its leaves are very similar to those of *A. calcaratum*. Rushforth (1994) found *A. chapaense* has milky sap and greenish bark and is closest to *A. amplum* Rehder and belongs to sect. *Platanoidea* Pax. After examination of type specimens, I found *A. chapaense* to be the same with *A. amplum* var. *jianshuiense* W. P. Fang, which is characterized by its leaves being broadly 3-lobed, basally 5-nerved, base rounded, lobes entire, inflorescences corymbose, nutlets compressed, and branchlets bark green.

The systematic position of *Acer calcaratum* has seldom been discussed, but van Gelderen (1994) placed it under sect. *Palmata* Pax ser. *Sinensia* Pojárkova.

To date, in China, *Acer calcaratum* has been found in only one locality of the

southernmost part of Yunnan Province bordering Myanmar. Thus, it is a critically endangered species in China.

2. *Acer acuminatum* Wall. ex D. Don, Prod. Fl. Nepal 279. 1825; Pax in Engl. Pflanzenr. 163 (8): 15. 1902; Kitamura in Kihara Fauna Fl. Nepal Himalaya 1744. 1955; Banerji & S. Das in Indian Forester 97 (5): 248. 1971; van Gelderen et al., Maples of the World 165. 1994; van Gelderen & D. M. van Gelderen, Maples for Gardens 29. 1999. Type: India. Srinagar, *Wallich 1225*, pro parte (lectotype here designated, K!)

长裂枫 新拟

Multi-stemmed small trees, to 10 m tall, dioecious. Branches often reddish green, smooth, glabrous; trunk green. Bud scales in pairs. Petioles often reddish, 5–10 cm, pubescent; leaf blade 6–12 cm long and about as wide, base subcordate-truncate, margin sharply serrate, often doubly toothed, apex caudate-acuminate, acumen 1–2 cm, abaxially glabrescent except hirsute in axils of secondary veins, secondary veins 5, 3–5-lobed, basal lobes insignificant, lobes triangular, apex acuminate. Flowers greenish, dioecious, 4-merous. Male inflorescence corymbose, axillary from leafless buds, female inflorescence racemose, terminal or axillary from mixed buds. Sepals 4, oblong, 3–4 mm long. Petals 4, ovate, shorter than sepals. Stamens 4–6, inserted outside disc. Ovary glabrous; style long, connate to about halfway. Infructescence 12–20 cm long; samaras 3–4 cm long; wings spreading at right angles; nutlets rugose. Fl. Mar.–Apr., fr. Sept.

China. **Xizang** (西藏): Yadong (亚东), Xigou (西沟), alt. 3100 m, 1975-10-23, Xizang Exped. (西藏队) 56 (PE); Jilong (吉隆): alt. 2750 m, 1981-09-14, Z. C. Ni (倪志诚) 2227 (PE).

Acer acuminatum is endemic to the Himalayas, distributed in northern India, Kashmir, Nepal and northern Pakistan. The specimens from Xizang represent the first record of this species in China.

Acer acuminatum belongs to sect. *Arguta* Rehder. The only species in the Himalayan flora similar to this species is *A. stachyophyllum* Hiern, but our species differs by its leaf blades being 3- or 5-lobed, lateral lobes usually as long as central lobe, apex of lateral lobes caudate-acuminate, and infructescence much longer, 12–20 cm.

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中国槭树科二新记录种

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摘要 三裂枫*Acer calcaratum* Gagnep.和长裂枫*Acer acuminatum* Wall. ex D. Don两种分布于东南亚和喜马拉雅地区的珍稀树种, 最近分别发现在我国云南和西藏有分布, 属于我国新记录种。三裂枫属于广义鸡爪槭组sect. *Palmata*中华槭系ser. *Sinensia*, 主要形态特点为叶片三裂, 叶片基部圆形, 伞房花序, 通常只有一个发育完全的果实, 坚果近卵球形。长裂枫属于尖齿槭组sect. *Arguta*, 主要特点为叶片3裂和5裂, 侧裂片和中央裂片近等长, 裂片先端长渐尖, 花序长达12–20 cm。

关键词 槭属; 槭树科; 新记录; 中国