

Grewia souladethiana, a new species of Malvaceae from Laos

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Abstract

Grewia souladethiana (Malvaceae-Grewioideae) is described and illustrated from Phou Hin Poun National Park, Khammouane Province, in central Laos. The new species grows at the edge of evergreen broad-leaved forest and in open grassland on the foot of limestone hills. To confirm the validity of the new species, diagnostic morphological characters were compared based on literature and herbarium materials at BKF, FOF, KAG and VNM as well as online digitized images. Morphologically it is similar to *G. thailandica* in having acuminate leaf apex, serrate leaf margin, and axillary inflorescences which are 2–3-flowered and with erect peduncle, but distinguished by its tree habit, shorter petioles, smaller sepals and petals, and solitary or 2-lobed fruits. A description, photographs, line drawings, vernacular name and preliminary conservation status are provided for it, as well as a key to species of *Grewia* in Laos is provided.

Key words: Endemic, flora, Indochina, limestones, Malvales

Introduction

Grewia Linnaeus (1753: 946), comprising 275 species, is a genus of shrubs and small trees of Malvaceae-Grewioideae distributed in the tropics and subtropics in the Old World, with center of diversity in Africa and Madagascar, where approximately two-thirds are found in the former, and nearly half of those are restricted to the latter (Karimi and Hanes 2024, Nisa *et al.* 2024, POWO 2024). This taxon is characterized by its tri-veined leaves, axillary cymose inflorescences, yellow or white petals usually shorter than the sepals, the presence of glands on the inner petals, and distinctively lobed fruits (Phengklai 1993, Chung 2005, Tang *et al.* 2007, Chantaranothai & Nualngam 2022).

In the account of *Grewia* for the flora of Laos, ten species have been recognized, namely, *Grewia abutilifolia* Ventenat ex Jussieu (1804: 92), *G. acuminata* Jussieu (1804: 91), *G. astropetala* Pierre (1888: 161), *G. celtidifolia* Jussieu (1804: 93), *G. eriocarpa* Jussieu (1804: 93), *G. hirsuta* Vahl (1790: 84), *G. lacei* Drummond & Craib in Craib

(1911: 21), *G. laevigata* Vahl (1790: 34), *G. retusifolia* Kurz (1872: 294), and *G. sessilifolia* Gagnepain (1910: 167) (Newman *et al.* 2007, 2017–present, POWO 2024; we removed *G. asiatica* Linnaeus (1767: 122) recorded in the former reference, as its voucher specimen *Soejarto 10730* is misidentification), most of which are widely distributed in Indochina and its neighbouring areas, and some species extending to Malesiana (e.g. *G. laevigata*) and to South Asia (e.g. *G. eriocarpa*).

Phou Hin Poun National Park, located in Khammouane Province in central Laos, is an area of outstanding geological and biological significance in Indochina. With its rich limestone karst landscapes, caves, and river systems, the region supports a diverse flora, including numerous endemic, rare, and ecologically important plant species, as well as vegetations such as scrublands on limestone karsts, seasonally dry evergreen forests, and evergreen forests—many of which remain poorly documented or understood by the public. Despite its ecological richness, biodiversity, and cultural value, public awareness and educational materials related to the region’s flora remain limited.

During our botanical surveys in limestone areas of Phou Hin Poun National Park in 2024 and 2025, we collected interesting specimens of *Grewia*. After a careful examination with preserved specimens in various herbaria, including online images available on the web, and consultation relevant literature, it was revealed to morphologically differ from any other previously known taxa of the genus. Therefore, we described and illustrated it as a new species, *Grewia souladethiana* Phengmala & Tagane.

Materials and methods

Field surveys

An unknown *Grewia* species was initially collected during our field survey in the limestone karst of Phou Hin Poun National Park, Hinboun District, Khammouane Province, in September 2024. Additional specimens were collected from Gnommalath District in September 2024, from Thakhek District in November 2024, and from Hinboun District in July 2025 (all districts are located in the same province, Fig. 1).

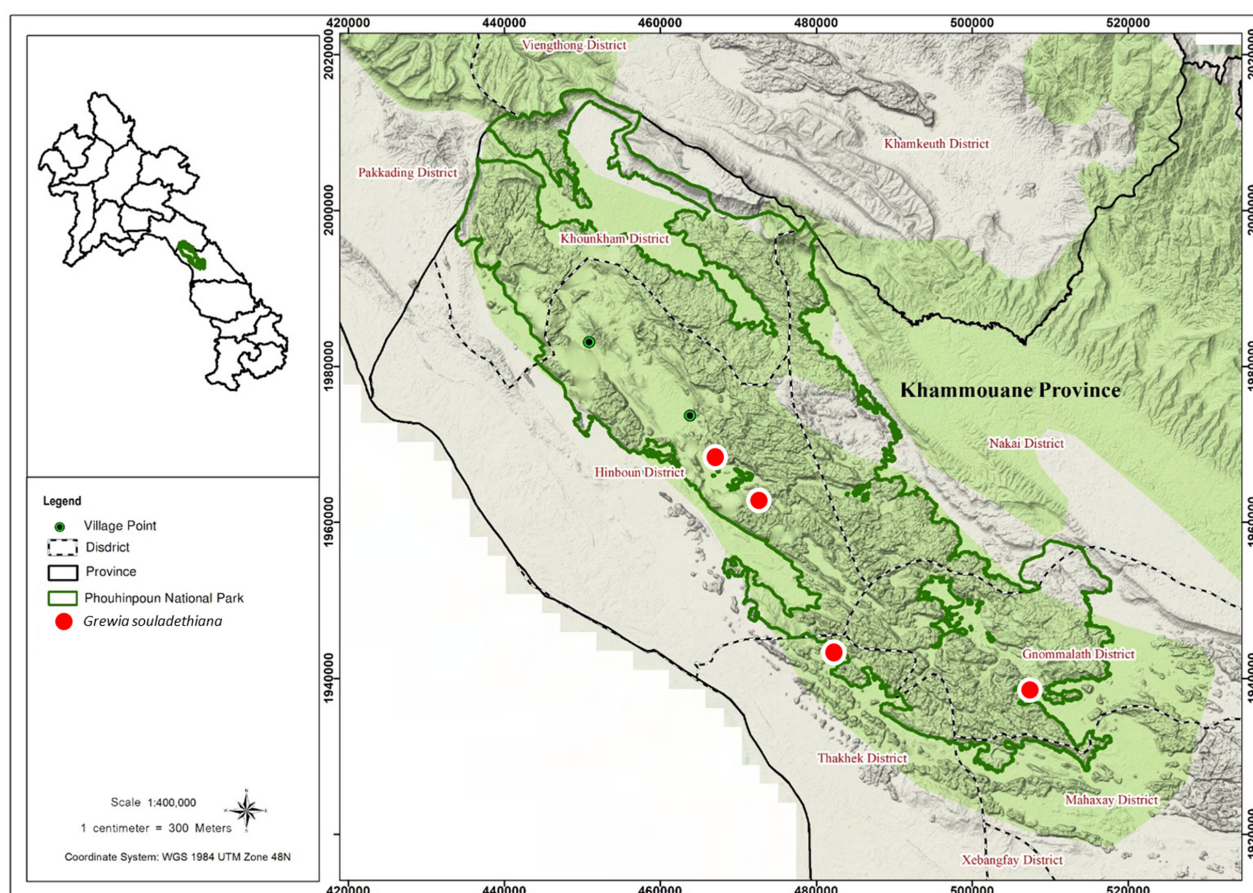


FIGURE 1. Map showing the collection sites of *Grewia souladethiana* in Phou Hin Poun National Park. (Sources: Khon CHANTHILATH. Forest Inventory and Planning Division, Vientiane Capital, Laos; ArcMap version 10.8)

Morphological observations

To assess the novelty of the new species, we consulted the taxonomic literature (Gagnepain 1910, 1945, Phengklai 1993, Ho 1999, Chung 2005, Tang *et al.* 2007, Chantaranothai & Nualngam 2022) and herbarium specimens housed in BKF, FOF, KAG, and VNM (Thiers, 2024) as well as digitized images on online resources (e.g. JSTOR Global Plants <https://plants.jstor.org/>). The terminology is followed Beentje (2012). The preliminary conservation assessment is based on the guidelines of the IUCN (2024). The photographs were taken in the field using digital camera (D7500, Nikon and OM-1, OM-System) and stereoscope binocular in the laboratory (Ivesta 3 Greenough Stereo Microscopes, Leica).

Taxonomic treatment

Grewia souladethiana Phengmala & Tagane, *sp. nov.* (Figs. 2 & 3)

TYPE:—LAOS. Khammouane Province: Hinboun Dist., Ban Houana, 17.825°N, 104.675°E, alt. 287 m, 7 September 2024, *S. Tagane, P. Souladeth, V.S. Dang, T. Vongthavone, K. Souvannakhoummane, P. Phonpaseuth, K. Phengmala, Q.T. Pham, T. Yamamoto, K. Yamazaki Z1741* [fl.] (holotype FOF [FOF0007156!], isotypes KAG [KAG188404!], KAG188405!], VNM).

Diagnosis:—*Grewia souladethiana* is similar to *G. thailandica* Chantaranothai & Nualngam (2022: 2) of Thailand, in having acuminate leaf apex, axillary 2–3-flowered inflorescences, and erect peduncles, but distinguished by its tree habit (vs. scandent shrubs to woody climbers in *G. thailandica*), longer acumen of leaf blades (up to 2.8 cm long vs. up to 1 cm long), shorter petioles (0.6–0.9 cm long vs. 1.0–1.3 cm long), smaller sepals (18 mm long vs. 25–27 mm long), smaller and triangular petals 2.0×1.8 mm (vs. oblong or lanceolate, $8.0\text{--}9.0 \times 3.0\text{--}4.0$ mm), and solitary or 2-lobed fruits (vs. (1–)3–4-lobed) (Table 1).

TABLE 1. Comparison of morphological characters between *Grewia souladethiana*, *G. thailandica* (Chantaranothai & Nualngam, 2022), and *G. abutilifolia* (Jussieu 1804, Phengklai 1993, Tang *et al.* 2007).

Characters	<i>G. souladethiana</i>	<i>G. thailandica</i>	<i>G. abutilifolia</i>
habit	trees, 3–4 m tall	scandent shrubs to woody climbers	shrubs or small trees 1–5 m tall
Leaf blade size (cm)	8.7–18.9 $\times$ 2.9–6.0	13–18.5 $\times$ 5.5–10	3–20 $\times$ 2–15
Leaf acumen length (cm)	up to 2.8	up to 1	NA
Petiole length (cm)	0.6–0.9	1.0–1.3	1.2
Peduncle length (cm)	0.9–1.4 cm	0.5–1.2 cm	0.1–0.6
Inner bract length (mm)	2.0 $\times$ 3.0	ca. 1.5 $\times$ 10	NA
Sepal shape and length (mm)	oblanceolate, 18 $\times$ 3.0	lanceolate or oblong-lanceolate, 25–27 $\times$ 3.0–5.0	narrowly oblong to oblong, 6–8 $\times$ 2
Petal shape and size (mm)	triangular, 2.0 $\times$ 1.8	oblong or lanceolate, 8.0–9.0 $\times$ 3.0–4.0	oblong, ca. 2–3 $\times$ 2–3
Number of lobes on fruit	1–2	(1–)3–4	2–4
Texture of hairy on fruit	sparsely hairy	stellate hairy or glabrescent	Tomentose, hirsute
Seeds shape and size (mm)	depressed obovoid-globose, 4.0 $\times$ 7.0	obovoid, 12–15 $\times$ 10–12	NA

Description:—Trees, 3–4 m tall. **Indumentum** simple or stellate hairs. **Young twigs** yellowish green *in vivo*, dark greyish brown *in sicco*, sparsely hairy, old twigs glabrous, lenticellate. **Stipules** linear, 5.0–8.0 mm long, almost glabrous on both surfaces. **Leaves** alternate; blades elliptic-oblong, ovate-oblong, 8.7–18.9 $\times$ 2.9–6.0 cm, length/width ratio 3–3.2, adaxial surface pale green, dull brownish yellow, sparsely hairy, abaxial surface dull yellowish green, sparsely hairy, apex acuminate, acumen up to 2.8 cm long, base attenuate or obtuse, symmetric or asymmetric, margin serrate, basal veins 3, midrib prominent on both surfaces, secondary veins 6–7 pairs, prominent abaxially, tertiary veins scalariform, distinct abaxially; petioles 0.6–0.9 cm long, sparsely stellate hairy. **Inflorescences** axillary, solitary or in cluster of 2- or 3-flowered; peduncle 0.9–1.4 cm long at anthesis, erect, sparsely hairy; outer bracts narrowly-lanceolate, 3.0 $\times$ 15 mm, apex acuminate, margin ciliate, caducous; inner bracts 3, whorled, narrowly oblong-lanceolate, 2.0 $\times$

3.0 mm, glabrous adaxially, sparsely hairy abaxially, apex acute, margin ciliolate, caducous. **Flowers** bisexual; pedicels 1.4–1.7 cm long; mature buds oblong-obovoid, 1.9×0.6 cm. **Sepals** free, 5, oblanceolate, 18×3.0 mm, apex acute, adaxial surface glabrous, abaxial surface verrucose, sparsely hairy, 2-grooved. **Petals** 5, free, triangular, 2.0×1.8 mm,



FIGURE 2. *Grewia souladethiana* Phengmala & Tagane: A. Flowering branch; B. Portion of abaxial leaf surface; C–D. Flowers; E. Petiole and base of lamina (abaxial surface); F. Cross section of fruit; G. Fruits. Photographed A, B, D, E by S. Tagane, C by D. Kongxaisavath, F–G by P. Souladeth.

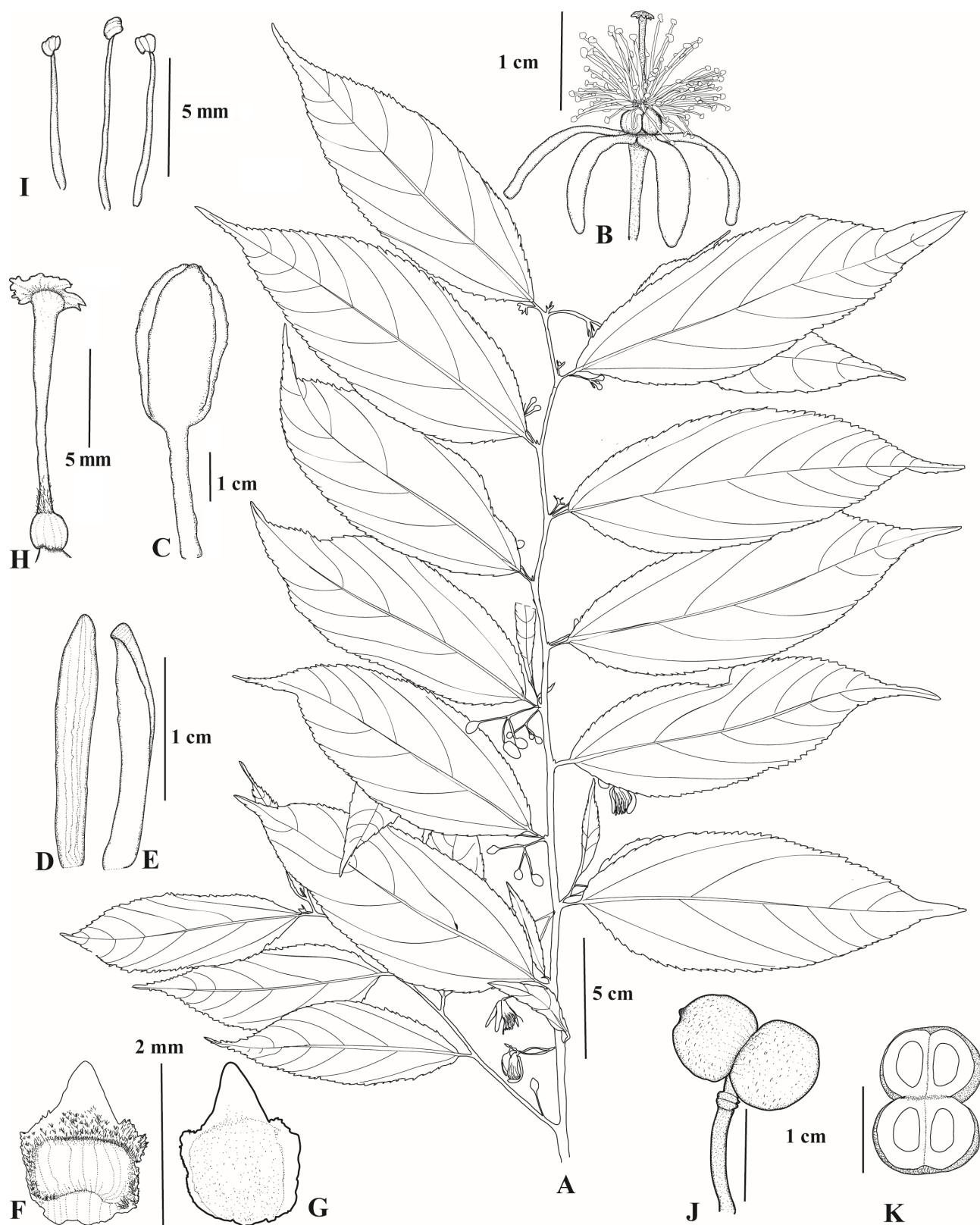


FIGURE 3. *Grewia souladethiana* Phengmala & Tagane. A. Flowering twig; B. Flower; C. Flower bud; D. Sepal, abaxial side; E. Sepal, adaxial side; F. Petal, adaxial side; G. Petal, abaxial side; H. pistil; I. Stamens. J. fruits; K. Cross section of fruit.. Drawing by K. Souvannakhommane.

glabrous on both surfaces, apex obtuse, margin entire, not ciliate, with clawed appendages, appendages glabrous on both surfaces, densely stellate hairy along margin, glands depressed globose. **Androgynophore**: lower part slightly grooved, 2.3×2.0 mm, glabrous; upper part cylindrical, 1.2×1.5 mm, densely hairy. **Stamens** numerous, filaments 2.8–6.5 mm long, anthers 1.1–1.3 mm long, glabrous. **Ovary** shallowly depressed globose, 1.8 mm in diam., hairy, 2-locular, 4 ovules per locule, style 7.8 mm long, sparsely hairy at basal 1/5, stigma 4–5 lobed. **Fruits** drupaceous, 1–2-lobed; lobes globose, 5.0–9.0 mm in diam., sparsely hairy; stipe 1.7–1.8 mm long. **Seeds** 2 per fruit, depressed obovoid-globose 4.0×7.0 mm, dark brown, scabrous, sparsely stellate hairy.

Additional specimen examined:—LAOS. Khammouane Province: Gnommalath District, near Ban Tat, Phou Hin Poun National Protected Area (currently National Park), at the edge of evergreen forest on limestone hill, 17.54504°N , $105.06574^{\circ}\text{E}$, 206 m elev., 5 September 2024, *S. Tagane et al.* Z1545 [fl.] (FOF [FOF0006635], KAG [KAG188212!], VNM); Thakhek District, Ban Pha Laem (Phatong), Phou Hin Poun National Protected Area (currently National Park), in open grassland on limestone hill, 17.5874°N , $104.824644^{\circ}\text{E}$, 190 m elev., 22 November 2024, *P. Souladeth et al.* Z1959 [fl. & fr.] (FOF [FOF0007028], KAG [KAG200707]), Hinboun District, Ban Bouamlou, Phou Hin Poun National Park, at edge of disturbed semi-evergreen forest, 17.75929°N , $104.73403^{\circ}\text{E}$, 190 m elev., 29 June 2025, *S. Tagane et al.* Z2740 [fl.] (FOF0008005, KAG202309, VNM).

Distribution:—LAOS (Khammouane Province) (Fig. 1).

Habitat and Ecology:—*Grewia souladethiana* grows at the edges of evergreen broad-leaved forests and in open grasslands on limestone hills, at elevations of 190–287 m.

Phenology:—Flowering specimens were collected in June, September and November, and fruiting in November.

Etymology:—The specific epithet honors Dr. Phetlasy Souladeth, a curator of FOF herbarium, Faculty of Forest Science, National University of Laos, who led our field surveys in Laos and encouraged the first author to intensively study on the Lao flora. Thanks to her, we could discover this new species.

Vernacular name:—ປີເລືອງສຸລະເດັດ (Por Leaug Souladeth) (suggested here).

Preliminary conservation assessment:—Vulnerable (VU). *Grewia souladethiana* is endemic to Khammouane Province and currently known from four locations, all within the protected areas in Phou Hin Poun National Park (Fig. 1). In each population, we observed 10–50 individuals. The area of occupancy (AOO) and the extent of occurrence (EOO) are calculated as 16 km² and 314 km², respectively, using GeoCAT (Bachman *et al.* 2011). Based on these information, it may satisfy the criteria of Endangered (EN). However, considering *G. souladethiana* is locally common in forest edges and open grassland, which are frequently affected by human disturbance, it is likely to be more widely distributed within the national park (a total area 2,388.2 km²) and its margins, we suggest its status as Vulnerable (VU) according to the criteria B1ab(iii), 2ab(iii) (IUCN 2024).

Notes:—Among ten species of *Grewia* previously known from Laos, *G. souladethiana* might resemble *G. abutilifolia*. However, it can be easily distinguished by its tree habit (vs. shrubs in *G. abutilifolia*), shorter petioles 0.6–0.9 cm long (vs. 1.0–2.0 cm long), elliptic-oblong to ovate-oblong leaf shape (vs. ovate to nearly orbicular), longer pedicels 1.4–1.7 cm (vs. 0.1–0.8 cm), more secondary veins (6–7 pairs in *G. souladethiana* vs. 3–4 pairs), and triangular petals ca. 2.0×1.8 mm (vs. oblong, $2-3 \times 1$ mm) (Jussieu 1804, Phengklai 1993, Tang *et al.* 2007).

Key to species of *Grewia* in Laos

1. Climbing shrubs or scrambling shrubs2
2. Leaf blades ovate to ovate-oblong, 4–6 cm wide; secondary veins ca. 10 pairs*G. acuminata*
2. Leaf blades lanceolate, to 3 cm wide; secondary veins 5–6 pairs*G. astropetala*
1. Erect shrubs or trees3
3. Inflorescence pendulous*G. sessilifolia*
3. Inflorescence erect4
4. Leaves narrowly lanceolate to oblong-lanceolate5
5. Small shrubs to 1 m tall; secondary veins 3–4 pairs*G. retusifolia*
5. Shrubs to trees, 1.5–10 m tall; secondary veins 4–11 pairs6
6. Leaves glabrous or glabrescent*G. laevigata*
6. Leaves hairy, especially densely tomentose on abaxial surfaces7
7. Leaf margin obscurely serrulate; secondary veins 7–11 pairs*G. lacei*
7. Leaf margin serrate; secondary veins 3–7 hairs*G. hirsuta*
4. Leaves ovate, orbicular or elliptic, oblong-elliptic8
8. Leaves ovate to orbicular, base symmetric*G. abutilifolia*
8. Leaves elliptic, oblong-elliptic, base asymmetric or symmetric9
9. Branches sparsely hairy to glabrous; leaves dull yellowish green abaxially*G. souladethiana*

9. Branches softly tomentose; leaves glaucous abaxially.....10
10. Fruits globose, not lobed. *G. eriocapra*
10. Fruits ovoid, 4-lobed *G. celtidifolia*

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