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Two new species and a revised key of *Grewia* (Malvaceae) from Thailand

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ABSTRACT

Two new species of the genus *Grewia*, *G. scabrifolia* and *G. thailandica*, from Thailand are described and illustrated; a revised key to the species of Thai *Grewia* is also presented.

KEYWORDS: Grewioideae, key, new taxa, taxonomy, Malvales.

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INTRODUCTION

Grewia was described by Linnaeus (1753) based on two species, namely, *G. occidentalis* L. and *G. orientalis* L. The genus contains approximately 150 species in the subfamily Grewioideae of the Malvaceae, and is distributed mainly in the Old World tropics and Australia (Bayer & Kubitzki, 2003). It is characterized by having tri-veined leaves, distinctively lobed fruits, axillary inflorescence, petals shorter than sepals, glands at the base of the inner petals, dorsifixed anthers and a peltate or lobed stigma (Kochumen, 1973; Phengklai, 1993).

In the account of *Grewia* for the Flora of Thailand, eight species were reported, viz. *G. abutilifolia* Vent. ex Juss., *G. eriocarpa* Juss., *G. hirsuta* Vahl, *G. lacei* Drumm. & Craib, *G. laevigata* Vahl, *G. sapida* Roxb. ex DC., *G. sessilifolia* Gagnep. and *G. winitii* Craib (Phengklai, 1986, 1993; Pooma & Suddee, 2014). Two unknown collections of *Grewia* from Thailand were examined, the first was collected from Surat Thani Province in the south, the others were from Tak Province in the north. Subsequently, the identification of these collections was attempted using the keys prepared for the Flora of Thailand (Phengklai, 1986, 1993), as well as keys from Floras and taxonomic literature from neighbouring countries: India (Masters, 1874), Myanmar (Kurz, 1877; Chung & Dorr, 2003), China (Tang *et al.*, 2007), Indo-China (Gagnepain, 1910, 1945), Laos (Newman *et al.*, 2007), Malaysia (Kochumen, 1973; Corner, 1988), and Peninsular Malaysia and Borneo (Chung, 2006). In addition, detailed comparisons with morphologically similar species and many type specimens of *Grewia* species were undertaken. The collections from Surat Thani and Tak Provinces were later identified as species new to science, and are described here as *G. scabrifolia* Chantar. and *G. thailandica* Chantar. & S.Nualngam, respectively. Ten species of *Grewia* are now recognized in Thailand. Tang *et al.* (2007) mentioned in the Flora of China that four species, *G. falcata* C.Y.Wu, *G. oligrandra* Pierre, *G. tiliifolia* Vahl and *G. urenifolia* (Pierre) Gagnep. are found in Thailand, and these additional names are also mentioned in Pooma & Suddee (2014). However, we have checked and found that these four species do not occur in Thailand.

MATERIALS AND METHODS

This study is based on herbarium specimens and field collections. Herbarium materials have been consulted at, or borrowed from herbaria, namely AAU, BK, BKF, K, KKU, KYO, PSU and QBG. Illustrations of the new species, as well as photos, information on examined specimens and ecological data are provided.

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DESCRIPTIONS

Grewia scabrifolia Chantar., **sp. nov.**

Grewia scabrifolia is different from other Thai species of *Grewia* in having thickly coriaceous and large leaves, which are ovate and scabrous, and a weakly unequal-sided leaf base. The fruit is distinctively globose and slightly rugose when dried. The new species is similar to *G. sclerophylla* Roxb. & G.Don, when using the key to species in the Tree Flora of Malaya (Kochumen, 1973), by having broadly ovate leaves with cordate leaf base. The most obvious distinguishing characters are the roundish leaf shape, obtuse leaf apex and unequal-sided leaf base of *G. sclerophylla*, compared with the broadly ovate leaves with an acuminate apex and weakly unequal-sided leaf base of *G. scabrifolia* (Table 1). Type: Thailand, Surat Thani, 08°55′N, 98° 40′E, 100–200 m alt., 25 Oct. 1991, *Larsen, S.S.Larsen, Barfod, Nanakorn, Ueachirakan & Sirirugsa 40855* (holotype **AAU!**; isotype **PSU!**). Figs. 1–2.

Tree, 4–5 m tall. *Leaves* thickly coriaceous, ovate, (11.5–)14–18 × (5–)7.5–9.5 cm; apex acuminate; base cordate, weakly unequal-sided; margin sparsely serrate, from base to apex, both surfaces with scabrate stellate hairs; midrib prominent on lower surface; basal veins 3; lateral veins 5–7 pairs; tertiary veins scalariform, distinct on lower surface, slightly raised on upper surface; venation hairy; petioles ca 9 mm long, terete, hairy. *Inflorescence* axillary, erect; peduncle 12–17 mm long, hairy. *Flowers* not seen. *Ovary* superior. *Fruits* drupaceous, globose, (1–)3–4-lobed; lobe ellipsoid, glabrescent, 14–16 × 8–10 mm; stipe 2–4 mm long.

Thailand.— PENINSULAR: Surat Thani.

Distribution.— Known from the type locality only.

Ecology.— No information is available on habitat and ecology other than the altitude being 100–200 m.

Vernacular.— Po yap (ปอหยาบ).

Etymology.— The specific epithet refers to the scabrous nature of the leaf surfaces.

Provisional National IUCN Conservation Assessment.— Data Deficient (DD). This species is endemic to peninsular Thailand, and also is so far known from the type collection from Surat Thani province. Further field collections are needed for more information.

Notes.— As only a fruiting collection has been collected in Thailand, therefore, no floral description for this new species is given.

Grewia thailandica Chantar. & S.Nualngam, **sp. nov.**

Similar in habit to the Chinese species *Grewia kwangtungensis* Hung T.Chang but differing in having a rounded or truncate leaf base (vs cordate or slightly cordate), ovate leaf shape (vs oblong or lanceolate), larger leaf size (13–18.5 × 5.5–10 cm vs 6–10 × 2–3 cm), longer petioles (10–13 mm long vs 5–6 mm long), longer peduncle (5–12 mm long vs 3–6 mm long) and hairy androgynophore (vs glabrous with hairs on the apex) (Table 2). *Grewia laevigata* Vahl is a tree and also has a climbing habit similar to *G. thailandica*. The former has an obtuse leaf base and glabrous androgynophore, whilst the latter has a rounded or truncate leaf base and hairy androgynophore

Table 1. Comparison of selected characters between *Grewia scabrifolia* and *G. sclerophylla*.

Characters	*G. scabrifolia*	*G. sclerophylla*[1]
Habit	tree	tree
Leaf		
shape	broadly ovate	rounded
apex	acuminate	obtuse
base	cordate, weakly unequal-sided	cordate, unequal-sided
margin	sparsely serrate	serrate
Basal veins	3	3–5

[1] Based on description of Don (1831).

Figure 1. *Grewia scabrifolia* Chantar.: holotype, *Larsen et al. 40855* (**AAU**). Photographed by B. Boonsuk.

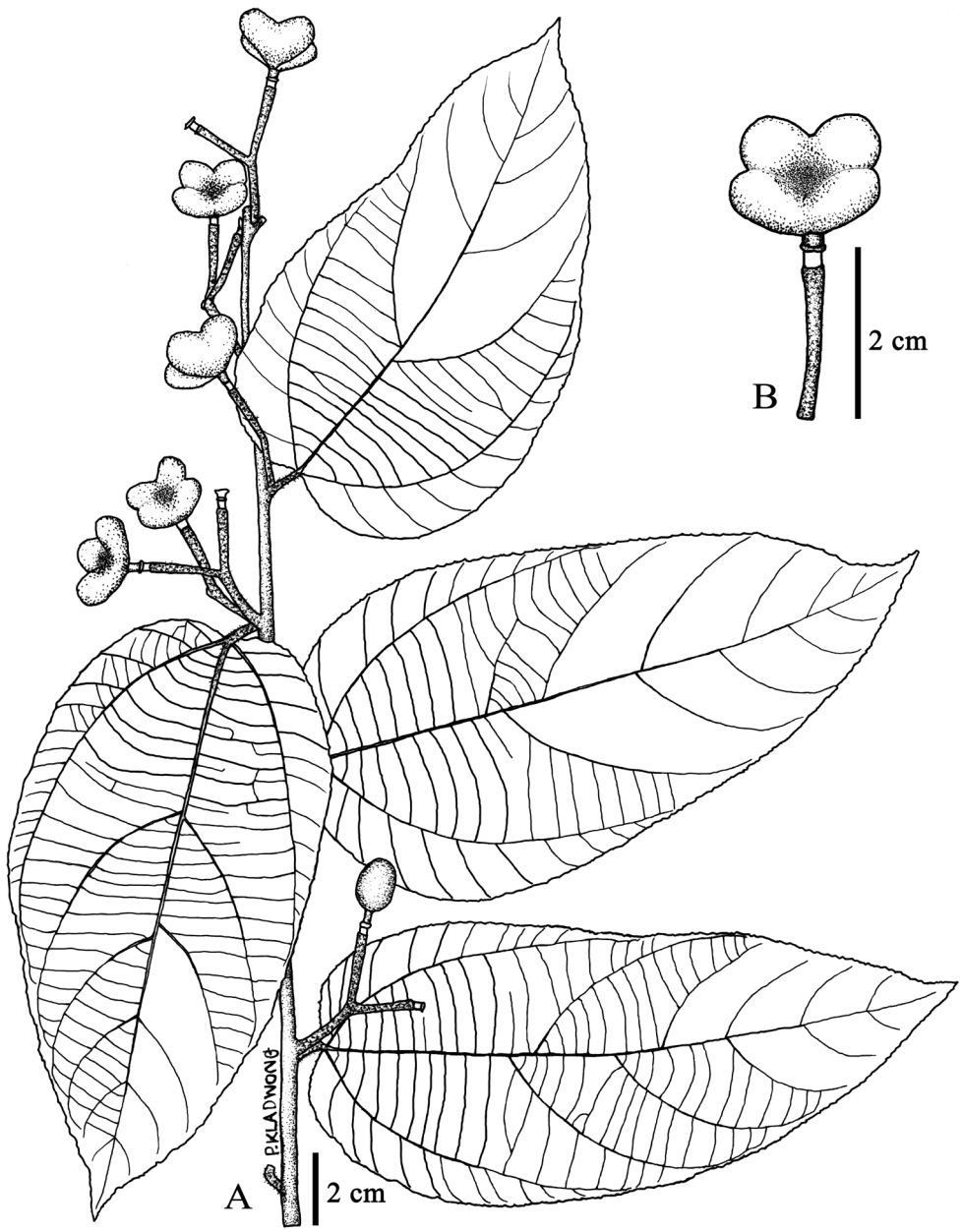

Figure 2. *Grewia scabrifolia* Chantar.: A. fruiting leafy branch; B. fruit. All from *Larsen et al. 40855* (**AAU**). Drawn by P. Kladwong.

(Table 2). Type: Thailand, Tak, Tha Song Yang, Mae Wa Luang subdistrict, along Mae Sod-Mae Sarieng Road no. 105 in evergreen forest, 47 Q 387393 E 1953267 N (ex.), 690 m alt., 29 Mar. 2021, *Nualngam 03* (holotype **KKU!**; isotypes **BKF!**, **QBG!**). Figs. 3–4.

Scandent shrub to woody climber. *Leaves* chartaceous, ovate, 13–18.5 × 5.5–10 cm; apex acute or acuminate, sometimes with acumen up to 1 cm long and a pointed tip; base rounded or truncate, equal-sided; margin serrate, from base to apex, both surfaces with scabrate stellate hairs; midrib prominent on lower surface; basal veins 3; lateral veins 5–6 pairs; tertiary veins scalariform, distinct on lower surface, slightly raised on upper surface; venation hairy; petioles terete, 1–1.3 cm long, hairy. *Inflorescence* 2–3-flowered, axillary, erect; peduncle 5–12 mm long, densely hairy; bracts caducous; outer bracts ovate-lanceolate, ca 12 × 3 mm, apex acuminate; inner bracts 3, whorled, narrowly oblong-lanceolate, ca 10 × 1.5 mm, apex acuminate. *Flower* bisexual; pedicels 7–11 mm long; mature buds lanceoloid, ca 25 × 9 mm. *Sepals* 5, free, lanceolate or oblong-lanceolate, 25–27 × 3–5 mm, apex acute, outside densely covered with yellowish brown stellate hairs, inside brownish and glabrous. *Petals* 5, free, oblong or lanceolate, 8–9 × 3–4 mm, apex acute or slightly 2-lobed, outside covered with yellowish brown stellate hairs along longitudinal midline from base to half of its length and glabrous toward the apex, inside covered with tufted hairs around the glands to ca 0.5 of its length and glabrous toward the apex; glands transversely broadly falciform; androgynophore slightly concave in outline, shallowly and narrowly longitudinal grooved. *Stamens* numerous, polyadelphous; filaments 6–12 mm long, glabrous; anthers dorsifixed, 2-lobed, kidney-shaped, longitudinally dehiscent, 0.4–0.7 mm diam. *Ovary* superior, ovoid, 2–4-loculed, ca 3 × 2 mm; stigma 4-lobed. *Fruits* drupaceous, covered with stellate hairs or glabrescent, (1–)3–4-lobed; lobe ellipsoid, 14–17 × 11–13 mm; stipe 4–6 mm long. *Seeds* obovoid, slightly compressed, 12–15 × 10–12 mm, scabrous.

Thailand.— NORTHERN: Tak [Tha Song Yang, 10 Sept. 2020, *Nualngam 02* (**BKF**, **KKU**, fruiting specimen); ibid., 690 m alt., 29 Mar. 2021, *Nualngam 03* (**KKU**, **BKF**, **QBG**); ibid., 19 Apr. 2021, *Nualngam 04* (**BKF**, **KKU**)].

Distribution.— Known from the type locality only.

Ecology.— In evergreen forest, ca 690 m. Flowering: March–May; fruiting: April–November.

Vernacular.— Po yap luea (ปอหยาบเลื้อย).

Etymology.— The specific epithet refers to Thailand.

Provisional National IUCN Conservation Assessment.— This species is endemic to northern Thailand and found along Mae Sod-Mae Sarieng Road no. 105, Tak province. It is so far known from the type collection and there is no information on its current status or possible threats, therefore, Data Deficient (DD) is merited for this species (IUCN Standards and Petitions Committee, 2019).

Notes.— The comparison between reproductive parts of the new species with *Grewia kwangtungensis* is not possible because the Chinese species was described without a flower.

Table 2. Comparison of selected characters of *Grewia thailandica* and related species.

Characters	*G. kwangtungensis*[2]	*G. laevigata*[3]	*G. thailandica*
Habit	woody climber	scandent shrub to small tree	scandent shrub to woody climber
Leaf			
petiole (mm)	5–6	5–10	10–13
size (cm)	6–10 × 2–3	7–15 × 2.5–5	13–18.5 × 5.5–10
base	cordate or slightly cordate	obtuse	rounded or truncate
Peduncle (mm)	3–6	(7–)12–25(–27)	5–12
Androgynophore	glabrous with hairs on the apex	glabrous	hairy

[2] Based on descriptions of Chang (1982) and Tang *et al*. (2007).

[3] Based on descriptions of Phengklai (1993) and Chung (2006).

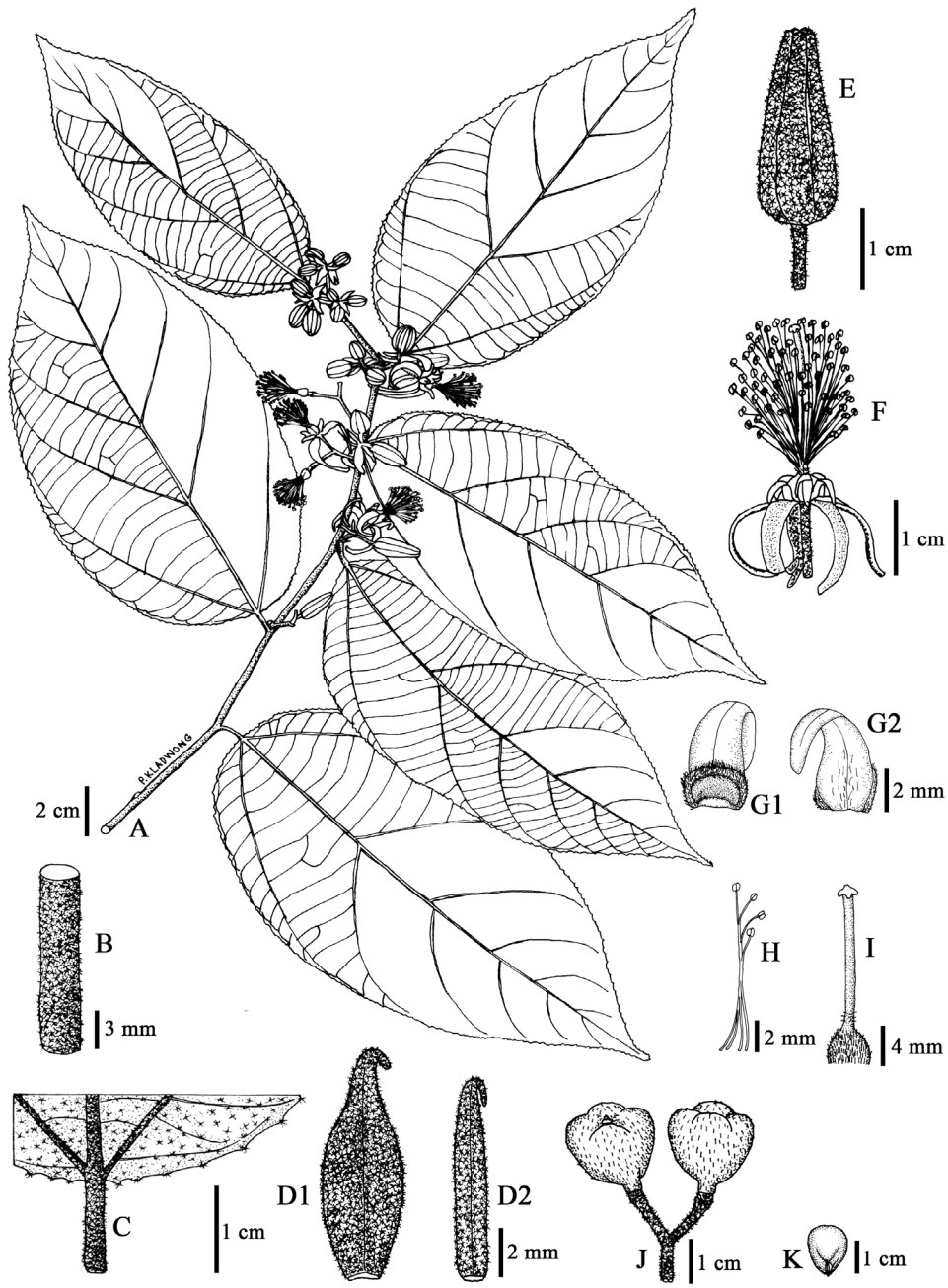

Figure 3. *Grewia thailandica* Chantar. & S.Nualngam: A. flowering branch; B. a portion of branch; C. detail of abaxial surface of leaf base; D. bracts (D1 outer, D2 inner); E. floral bud; F. flower; G. petals (G1 adaxial surface, G2 abaxial surface); H. stamens; I. a portion of pistil; J. fruits; K. seed. All from *Nualngam 03* (**KKU**) except fruits and seed from *Nualngam 02* (**KKU**). Drawn by P. Kladwong.

A REVISED KEY TO THE SPECIES OF *GREWIA* IN THAILAND

1. Leaves ovate, orbicular or elliptic
  2. Inflorescence pendulous
    3. Basal veins of leaves 3; lateral veins 4–8 pairs; leaf margin finely serrate or doubly serrate **G. sessilifolia**
    3. Basal veins of leaves 4(–6); lateral veins 3–5 pairs; leaf margin coarsely serrate or dentate **G. winitii**
  2. Inflorescence erect
    4. Leaf base unequal-sided **G. eriocarpa**
    4. Leaf base equal-sided or weakly unequal-sided
      5. Scandent shrub to woody climber **G. thailandica**
      5. Tree or shrub
        6. Small shrub up to 0.5 m tall; petioles less than 7 mm long **G. sapida**
        6. Tree or shrub up to 5 m tall; petioles more than 7 mm long
          7. Leaf surfaces tomentose; lateral veins 3–4 pairs; petioles 10–20 mm long **G. abutilifolia**
          7. Leaf surfaces scabrous; lateral veins 5–7 pairs; petioles ca 9 mm long **G. scabrifolia**
1. Leave oblong or lanceolate
  8. Leaves glabrous or glabrescent; sepals more than 1 cm long **G. laevigata**
  8. Leaves hairy; sepals less than 1 cm long
    9. Basal veins extending less than ½ of leaf length; lateral veins 7–11 pairs; lower surface of leaves golden brownish; dentation of leaf margin inconspicuous **G. lacei**
    9. Basal veins extending more than ½ of leaf length; lateral veins 3–7 pairs; lower surface of leaves not golden brown; dentation of leaf margin very conspicuous **G. hirsuta**

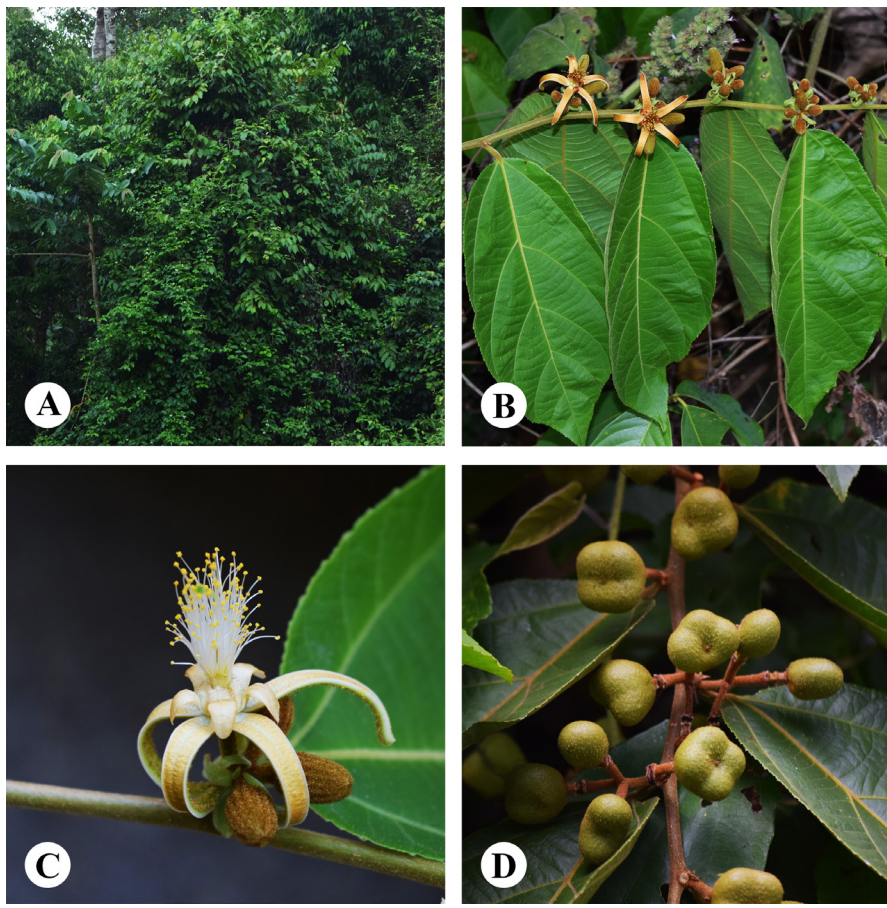

Figure 4. *Grewia thailandica* Chantar. & S.Nualngam: A. habit; B. flowering branch; C. flower; D. fruits. Photographed by S. Nualngam.

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