

***Schisandra grandiflora* (WALL.) HOOK. F. & THOMSON  
(SCHISANDRACEAE: SECT. *PLEIOSTEMA*), A NEW RECORD  
FOR THE FLORA OF VIETNAM**

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**ABSTRACT**

*Schisandra grandiflora* (Wall.) Hook. f. & Thomson (Schisandraceae: sect. *Pleiostema*), the specimens collected in Ha Giang, Cao Bang, and Vinh Phuc provinces, as a new recorded species for the flora of Vietnam. A morphological comparison with related species and a key to species in Vietnam was provided. A description including details of distribution and habitat is supplied with a line-drawing.

**Keywords:** Schisandraceae, Schisandra, *Pleiostema*, *Schisandra grandiflora*, new recorded, Vietnam.

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## INTRODUCTION

Genus *Schisandra* Michx. belongs to the family Schisandraceae in the order Austrobaileyales (APG IV, 2016). Currently, there are 26 described species (Saunders, 2001; Yang & Lin, 2009; Lin et al., 2011; Cuong et al., 2019), species of the genus are widely distributed in North America, Far East Siberia, Japan, Nepal, Bhutan, India, Indonesia and Indo-China. (Saunders, 2000, 2001; Xia et al., 2008; Lin et al., 2011). Based on the results of cladistic analysis (Lin & Yang, 2007), the genus *Schisandra* Michx. was divided into two subgenera, subgenus *Schisandra* and subgenus *Sphaerostema*. Subgenus *Schisandra* was subdivided into four sections: section *Pleioestema* A. C. Sm., section *Maximowiczia* (Ruprecht) T. Nakai, section *Sinoschisandra* (Y. W. Law) Q. Lin & Z. R. Yang and section *Schisandra* while subgenus *Sphaerostema* comprised merely *Schisandra propinqua* (Wall.) Baill. and *S. plena* A. C. Sm. Yang & Lin (2009) and Lin et al. (2011) described two new species in subgenus *Sphaerostema*, namely *Schisandra parapropinqua* Z. R. Yang & Q. Lin from southwest China and *Schisandra macrocarpa* Q. Lin & Y. M. Shui from Yunnan, China and Cuong et al. (2019) described a new species in subgenus *Sphaerostema*, namely *Schisandra cauliflora* N. T. Cuong, D. V. Hai, N. Q. Hung & M. H. Dat from Vietnam. Section *Pleioestema* comprises four species, namely *Schisandra grandiflora*, *Schisandra incarnata*, *Schisandra rubriflora* and *Schisandra sphaerandra*.

In Vietnam, its most recent revisions the genus *Schisandra* comprises eight species (Ho, 1999; Ban, 2003; Cuong et al., 2006, 2019). Nguyen et al. (2020) described a new subspecies in the section *Sinoschisandra*, namely *Schisandra henryi* Clarke subsp. *hoatii* N.S. Ly & X.T. Nguyen. But in our opinion, this subspecies is the synonym of *Schisandra sphenanthera* Rehder & E.H. Willson. The name *S. grandiflora* was cited by Gagnepain (Gagnepain, 1938; Ho, 1991, 1999). But in the aforementioned literatures, the authors mistakenly described

the name *S. grandiflora* for species *S. rubriflora*, which was corrected by Ban (2003). Therefore only one species *S. rubriflora* belonging *Pleioestema* has been recorded in Vietnam. During our study on specimens of genus *Schisandra* in our herbarium, Institute of Ecology and Biological Resources, Ha Noi (HN), we found specimens of species *S. grandiflora*. We described it as a new record for the flora of Vietnam.

## MATERIALS AND METHODS

The dried specimens of species *Schisandra grandiflora* were collected in Dong Van and Vi Xuyen districts, Ha Giang province in 1977, in Nguyen Binh district, Cao Bang province in 2004, and in Phuc Yen district, Vinh Phuc province in 2018, all specimens are kept in HN. Taxonomic identification was done using morphological reproductive and vegetative characters following the aforementioned literature, especially (Saunders, 2000, 2001; Xia et al., 2008; Lin et al., 2011).

## RESULTS

*Schisandra grandiflora* (Wall.) Hook. f. & Thomson, 1872 (Fig. 1).

In D. J. Hooker: *Fl. Brit. Ind.* 1: 44, (as *Schizandra*). *Kadsura grandiflora* Wall., 1824. *Tent. Fl. Nepal*, 10: 10, pl. 14. - *Sphaerostema grandiflorum* (Wall.) Blume, 1830. *Fl. Javae*, 17. (as “*S. Grandifloro*”). Type: Nepal [Mt. Sheopore], 1821, *N. Wallich* 4985 (Lecotype: K, HUK designated by R. M. K. Sanders, 2000. *Syst. Bot. Monogr.* 58: 54. Photo!). Isolectotypes: C, CH, GH, HKU.

**Description:** Dioecious or monoecious, evergreen, glabrous, woody vines to 15 m long. Young branches lacking wings, with fugacious perules at base, leaf-bearing branches elongated. Leaves simple, in spirals, glabrous; petioles 4–6 cm long; laminae ovate or broadly elliptic, 8–12 cm long, 3.5–5 cm wide, papery; base acute to attenuate, rarely rounded or obtuse; apex shortly to long acuminate; margin denticulate to subentire; midvein impressed on both surfaces, secondary veins 4–7 on each side, nearly arcuate and impressed on both

surfaces when dry. Flowers solitary, borne in axils of fugacious bracts at base of young shoots, glabrous; peduncles 1.5–2.5 cm long in male flowers, 3.5–4.5 cm long in female flowers, 6–8 cm long in fruiting. Tepals 6–9, cream-white, white, or pink-tinged in outermost tepals; the outermost tepal ovate, 0.9–1.2 cm long, 0.6–0.9 cm wide; the largest tepal elliptic, ovate or obovate, 1.0–1.7 cm long, 0.7–1.5 cm wide; the innermost tepal elliptic, ovate or obovate, 0.7–1.2 cm long, 0.5–0.8 cm wide. Staminate flowers with 30–50 free stamens, spirally arranged around

flora axis, uppermost stamens not connated, stamens 2.1–2.3 mm long, 1–1.2 mm wide; thecae extrorse-lateral. Pistillate flowers with ovoid gynoeceum, 4.5–5 mm across, with 65–120 free carpels, carpels 1–2 mm long, 0.7–1.0 mm wide, pseudostyle broad. Fruiting peduncles glabrous, elongated, 4–10 cm long; torus 12–18 (-25) cm long, 3.5–4.5 mm across; apocarps 28–35, ovoid, 6–10 mm long, 4.5–8 mm across, green to bright red. Seeds usually 2 per apocarp, 3–3.5 mm long, 3.5–4 mm wide, yellow, discoid to flattened-reniform; testa smooth.

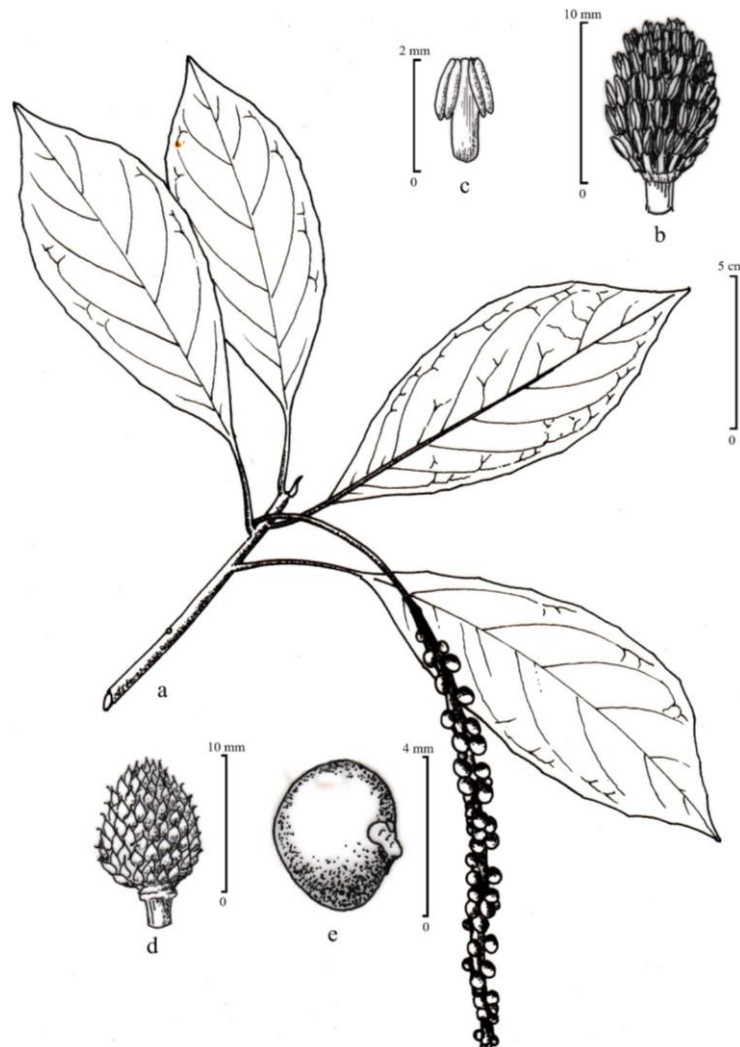


Figure 1. *Schisandra grandiflora* (Wall.) Hook. f. & Thomson, 1872: a) branch bearing leaves and fruit; b) androecium; c) stamen; d) gynoeceum; e) seed (a: N. H. Hien 057, HN; b–e: N. T. Cuong s.n., HN) (Drawing by N. Q. Hung)

**Distribution and habitat:** *Schisandra grandiflora* has been recorded in India (Himachal Pradesh, Uttar Pradesh, Sikkim, and northern West Bengal), Nepal, Bhutan and China (southern Xizang). Typically climbing on slopes, shrubs, and small trees, in broad-leaved, coniferous, or mixed forests dominated by *Abies*, *Picea*, *Pinus*, *Quercus*, *Rhododendron*, and *Tsuga*; (1800-) 2100–3300 (-4000) m. (Saunders 2000, Xia et al. 2008).

In Vietnam, specimens of *S. grandiflora* were found in Cao Bang province (Nguyen Binh district: Phia Oac mountain), Ha Giang province (Vi Xuyen district: Cao Bo commune; Dong Van district: Pho Bang commune), Vinh Phuc (Phuc Yen town: Me Linh Station for Biodiversity).

Climbing on shrubs, and small trees in the evergreen broad-leaved forest, or mixed broad-leaved and bamboo forests on soil or limestone mountains at altitudes of 500–1,750 m.

**Additional specimens:** *N. H. Hien 057* (HN!), Ha Giang province, Dong Van district, Pho Bang commune, 08 August 1977; *D. K. Harder et al. 5643* (HN!), Ha Giang province, Vi Xuyen district: Cao Bo commune, 17 September 2000; *V. X. Phuong et al. 8298* (HN), Cao Bang province, Nguyen Binh district, Phia Oac mountain, 16 June 2004; *N. T. Cuong et al. s.n.* (HN!), Vinh Phuc province, Phuc Yen town, Me Linh Station for Biodiversity, July 2018.

**Phenology:** Flowers from March to April and fruits from June to September.

Table 1. Comparison of morphological characteristics of *Schisandra grandiflora* with its putative ally, *Schisandra rubriflora* in Vietnam

Characters	<i>Schisandra grandiflora</i>	<i>Schisandra rubriflora</i>
Leaves (cm)	Petioles 4–6 cm long; margin denticulate to subentire	Petioles 1.5–3 cm long; margin denticulate to serrulate
Flowers	Peduncles 3.5–4.5 cm long in female flowers; Tepals cream-white, white, or pink-tinged in outermost tepals	Peduncles 2.0–3.0 cm long in female flowers. Tepals red deep purplish red to deep red
Carpels	Carpels 65–120	Carpels 50–70
Fruits	Peduncles 4–10 cm long; torus 12–18 (-25) cm long	Peduncles (4-)5–7(-8) cm long; torus 9–12 cm long

**Key to species of genus *Schisandra* Michx. in Vietnam**

- 1A. Flowers often with “secondary” flowers in axil of prophyll, occasionally in clusters, sometimes solitary; androecium of connate stamens.....**Subgen. *Sphaerostema***
- 2A. Laminas ovate, ovate-elliptic, ovate-oblong or elliptic, usually 3.5–12 cm wide, margins entire; seeds 5–10 mm long, hilum large, U-shaped.
- 3A. Flowers usually 9–17 in clusters or short racemes, rarely solitary, peduncles 3–6 cm long; stamens 14–17.....1. *S. cauliflora*
- 3B. Flowers solitary or 2 – 8 in clusters or racemes, peduncles 0.3–1.5 cm long; stamens 3–9.....2. *S. plena*
- 2B. Laminas narrowly lanceolate, lanceolate, lanceolate-oblong or elliptic, usually 1–4 cm wide margin serrate or serrulate; seeds 3–5.5 mm long, hilum small, V-shaped .....3. *S. propinqua*
- 1B. Flower solitary, “secondary” flowers absent; androecium composed of essentially free stamens, apical stamens occasionally connate.....**Subgen. *Schisandra***
- 4A. Pseudostyles small or narrow.

- 5A. Stamens 5; apical stamens not connate; thecae extrorse-lateral.....**Sect. Maximowiczia** (4. *S. chinensis*)
- 5B. Stamens > 5; apical stamens connate; thecae introrse-lateral or lateral.....**Sect. Sinoschisandra**
- 6A. Young branches, abaxial leaf lamina, petioles, and peduncles pubescent..5. *S. pubescens*
- 6B. Young branches, abaxial leaf lamina, petioles, and peduncles without pubescens.
- 7A. Young branches wings, with fugacious perules at base.....6. *S. perrulata*
- 7B. Young branches lacking wings, without fugacious perules at base.....7. *S. sphenanthera*
- 4B. Pseudostyles large or board.....**Sect. Peiostema**
- 8A. Petioles 1.5–3 cm long; peduncles 2–3 cm long in female flowers; torus 9–12 cm long...  
.....8. *S. rubriflora*
- 8B. Petioles 4–6 cm long; Peduncles 3.5–4.5 cm long in female flowers; torus 12–16 cm long.....9. *S. Grandiflora*

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