Phytotaxa 260 (3): 291–295
http://www.mapress.com/j/pt/

Article

ISSN 1179-3155 (print edition)
PHYTOTAXA
ISSN 1179-3163 (online edition)

http://dx.doi.org/10.11646/phytotaxa.260.3.9

Cissus erecta (Vitaceae), a new non-viny herbaceous species from Mt. Popa, Myanmar

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Abstract

Cissus erecta, a new endemic species of Vitaceae from Myanmar, is described and illustrated. The species is similar to *C. aubertiana* in habit, but it is readily distinguished by its less deeply lobed leaves with serrate margins, persistent stipules, and larger berries. This species is also similar to *C. woodrowii* in leaf shape, but it is distinguished by having herbaceous habit, leaves with serrate margin, greenish and persistent stipules, compound umbel, and larger globose berries.

Keywords: Mandalay, Endemic species, *Cissus aubertiana*, *C. woodrowii*

Introduction

Cissus Linnaeus (1753: 117) is the largest genus in the family Vitaceae with about 350 species mainly distributed in tropical regions of Africa, Asia, Australia, Central and South America, and North America (Mexico) (Soejima & Wen 2006, Ren & Wen 2007, Wen 2007, APG III 2009, Trias-Blasi *et al.* 2012). *Cissus* comprises woody and herbaceous vines and is generally distinguished from the remaining Vitaceae genera by having well-developed, thick and undivided floral disks, tetramerous flowers, one-seeded fruits, and seeds with a long and linear chalaza (Descoings 1960, Wen 2007, Chen & Manchester 2011).

In Myanmar, nine species were reported in the genus *Cissus* (Kress *et al*. 2003), one of which, *C. aubertiana* (Gage 1904: 36) Singh & Shetty (1986: 596), is known to be an endemic species growing in the Chin Hills of central Myanmar. Current species counts in adjacent countries suggest 25–30 species in Thailand, 15 in China, and 18 in India, respectively (Gagnepain 1912, Ren & Wen 2007, Trias-Blasi *et al*. 2009, GBIF 2015).

During a floristic survey on the Popa Mountain Park in central Myanmar, we collected a non-viny herbaceous *Cissus* species that does not appear to match any previously reported species (Lawson 1875, Gagnepain 1912, Kress *et al.* 2003, Ren & Wen 2007, Newman *et al.* 2007) (Figures 1 & 2). The species resembles the Myanmar endemic species *C. aubertiana* in its habit, and the Indian species *C. woodrowii* (Stapf ex Cooke 1902: 248) Santapau (1948: 276) in its leaf shape. A comparative study between the type specimens and additional specimens, however, revealed that it differs from those known species (Table 1) and it is here described as a new species.

Taxonomic treatment

Cissus erecta S.H. Cho & Y.D. Kim, *sp. nov*. (Figs. 1 & 2)

Diagnosis: *Cissus erecta* is similar to *C. aubertiana* in habit, but it is readily distinguished from the latter by its less deeply lobed (sinuses extending 1/5 to 2/5 of the distance to the vein junction) leaves with distinctly serrate margin, persistent stipules, and larger berries. This species is also similar to *C. woodrowii* in leaf shape, but it is distinguished from the latter by having a non-viny herbaceous habit, leaves with serrate margin, greenish and persistent stipules, a compound dichasium, and larger globose berries (Table 1).

Accepted by Yunfei DENG: 15 Apr. 2016; published: 13 May 2016

FIGURE 1. *Cissus erecta* S.H. Cho & Y.D. Kim. A–B. Flowering individual. C. Inflorescence (flowering). D. Inflorescence (fruiting). E–G. Flower. E. Flower bud. F. Mature flower. G. Disk and stigma. H–I. Mature fruit. J. Seeds. K. Mature flower (longitudinal section). L. Immature fruit (longitudinal section). M. Stem node with a pair of stipules. N. Stipule. O. Pedicel (muriculate, at flowering time). P. Leaf margin. Q. Leaf (lower surface).

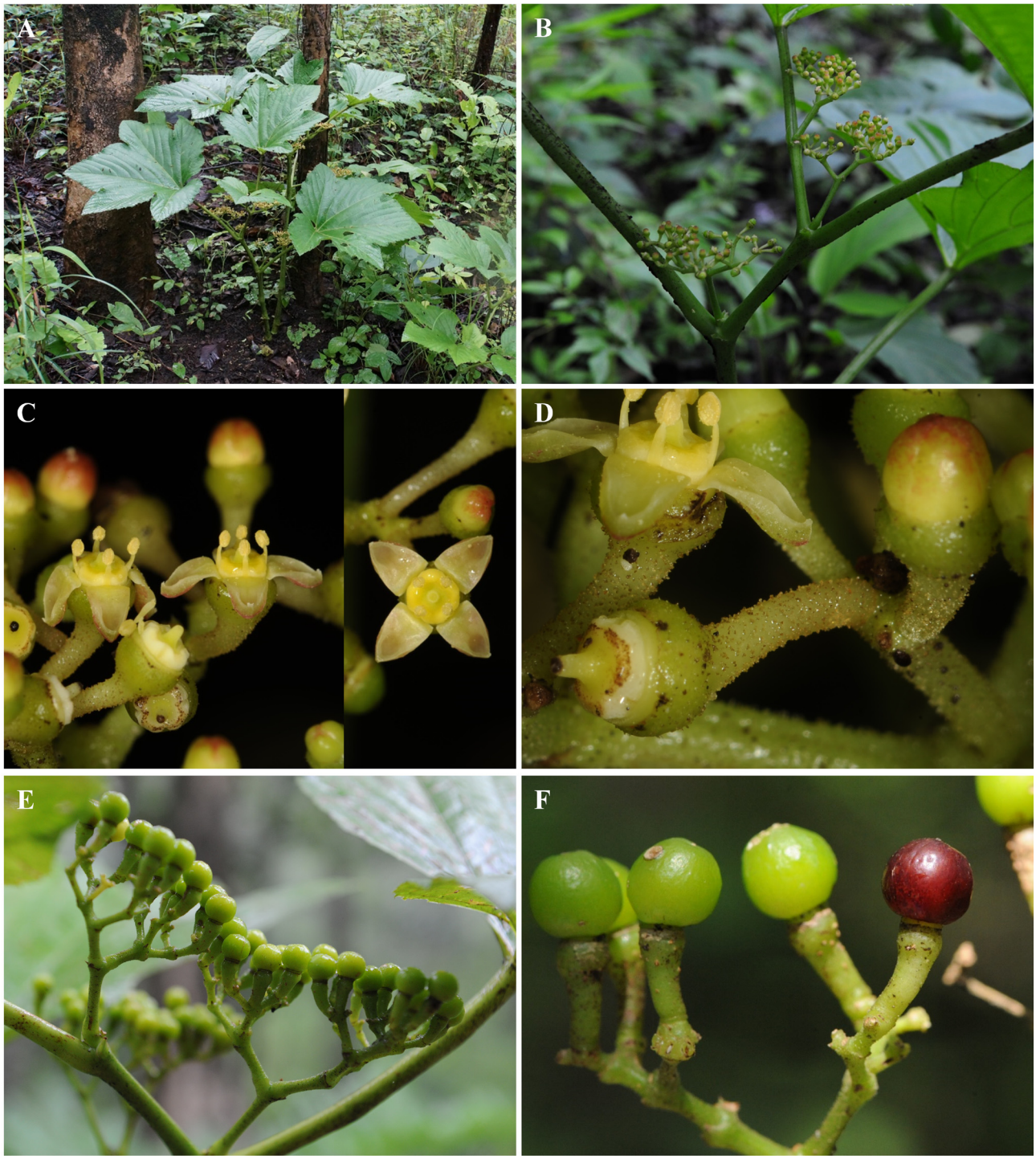

FIGURE 2. A–F. *Cissus erecta* S.H. Cho & Y.D. Kim. A. Habit. B. Inflorescence. C. Flower. D. Pedicel. E. Infructescence. F. Berry.

Type:—MYANMAR. Mandalay: Popa Mountain Park, 20˚54'08.5"N, 95˚15'46.8"E, elev. 776 m, 23 July 2015, *S.H. Cho et al. MM-5057* (holotype KB!; isotype HHU!, K!, RAF!).

Herbs, perennial, erect, 35–75 cm in height, hermaphrodite. Roots well developed vertically, 2–4 cm in diameter. Stem nearly terete with conspicuous longitudinal ridges, pubescent above the middle, glabrescent below the middle. Tendrils absent. Leaves simple, alternate; petiole 4.2–13.5 cm long, pubescent; stipules 2, triangular, 8.2–8.8 × 3.8–5.7 mm, apex acute, margin entire, greenish, puberulent, persistent; leaf blade orbicular, palmately 3–7-lobed (sinuses extending 1/5 to 2/5 of the distance to the vein junction), 14–29 × 15–36 cm, base cordate, apex acute, margin serrate, lobe tip mucronate, upper surface sparsely puberulent along the veins, lower surface pubescent, particularly densely pubescent at base of the midrib, basal veins 4–7, lateral veins 7–9 pairs, veinlets slightly raised. Inflorescence

compound dichasium, axillary to pseudo-terminal, many-flowered, with bracts at nodes; bracts 2, triangular, up to 3.5 × 2.7 mm, apex acute, margin entire, puberulent, persistent; peduncle 3.5–10 cm long (up to 16 cm long when fruiting), secondary peduncle 2.0–4.7 cm long, tertiary peduncle 1.3–2.9 cm long, puberulent; pedicels 3.8–5.0 mm long, ca 0.8 mm in diam., muriculate, becoming sparsely verrucate when fruiting, 8.1–13.6 mm long, 2.9–4.0 mm in diam.. Flowers 4-merous, actinomorphic, ca. 7.5 mm in diam., buds oval, yellowish red. Calyx subcupuliform, undulate, teeth inconspicuous. Petals valvate, triangular-ovate, thickened at the apex, 2.4–2.6 × 1.7–1.9 mm, glabrous, lower surface yellowish red, upper surface pale yellow, caducous; anthers 0.85 mm long, filament subulate, 1.3 mm long; disk undulately 4-lobed, 2.4 mm in diam.; ovary adnate with the disk, ca. 1.0 × 1.5 mm, glabrous; style conspicuous, terete, 0.8–1.0 mm long, 0.45 mm in diam., base slightly thick; stigma entire, subcapitate. Fruit a berry, globose, 8.2–8.5 mm in diam., 1-seeded. Seed ovate, 5.8–6.3 × 4.2–4.5 mm, smooth, with sparsely scattered dot or lacking, with inconspicuous raphe, ventral holes inconspicuously obovate to elliptic.

TABLE 1. Comparison of key features of *C. erecta*, *C. woodrowii* and *C. aubertiana*.

	C. erecta	*C. woodrowii*	*C. aubertiana*
Habit	herb	shrub	herb
Height	35–75 cm	150–180 cm	ca. 100 cm
Leaf			
blade division	palmately 3–7-lobed (sinuses extending 1/5 to 2/5 of the distance to the vein junction)	shortly (rarely obscurely) 3(5)-lobed (sinuses extending less than 1/5 of the distance to the vein junction)	palmately 3–6-divided (sinuses extending more than 3/4 of the distance to the vein junction)
size	14–29 × 15–36 cm	20–30 × 20–25 cm	11–25 × 10–23 cm
margin	distinctly serrate	incurvedly crenate	distantly or obscurely serrate
Stipule			
color	greenish	reddish	not observed
duration	persistent	caducous	caducous
Inflorescence	compound dichasium	compound umbel	compound dichasium
Peduncle			
length	3.5–10 cm (up to 16 cm in fruiting time)	2.5 cm (up to 5.1 cm in fruiting time)	4.5–8.5 cm
surface	puberulent	sparsely pubescent becoming glabrous when mature	glabrous (or sparsely scurfy)
Berry			
shape	globose	obovoid-globose	globose
diameter	8.2–8.5 mm	ca. 6 mm	7.4–7.6 mm

Distribution:—*Cissus erecta* is a rare plant only locally distributed in the Popa Mountain Park in central Myanmar, hence it is endemic to the region. Until now only three subpopulations, each consisting of 10 to 40 individuals have been discovered in the Park area.

It is therefore preliminarily classified as Vulnerable (VU) according to IUCN Red List criteria (IUCN 2001).

Ecology:—It grows in mixed forests [with *Gmelina arborea* Roxburgh (1814: 46), *Holarrhena pubescens* Wallich & Don (1837: 78), *Pterospermum acerifolium* Willdenow (1800: 729), *Ziziphus oenopolia* (Linnaeus 1753: 194) Miller (1768: *Ziziphus* No. 3)] on the southern slope (650–800 m) of the mountain. Flowering from July to August; fruiting from October to November.

Etymology:—The specific epithet of the new species refers to the erect, non-viny and herbaceous nature of the species.

Additional specimens examined (Paratypes):—MYANMAR. Mandalay: Popa Mountain Park, 20˚54′01.1″N 95˚15′44.3″E, 753 m, 30 July 2012, *S.H. Cho et al. MM-1343* (HHU! 4 sheets); same locality, 20˚53′41.1″N 95˚14′29.9″E, 698 m, 26 October 2013, *S.H. Cho et al. MM-2874* (HHU! 3 sheets); same locality, 20˚ 54′ 04.4″N 95˚ 13′ 57.5″ E, 670 m, 12 July 2012, *Khin Myo Htwe 0166* (RAF!, HHU!).

Acknowledgements

We thank Ms. Hye-Woo Shin (http://www.hyewoo.com/) for preparing the line drawing. This work was funded by National Institute of Biological Resources of Korea.

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