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Wrightia vietnamensis (Apocynaceae), a new species from Vietnam

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Summary. A new species of *Wrightia* (Apocynaceae) from Vietnam, *Wrightia vietnamensis* Hazell & D.J.Middleton, is described and illustrated. Seed was collected on a Vietnamese led international collaborative expedition and grown on in the Temperate House at the Royal Botanic Gardens, Kew. When it matured and flowered, it was found to be an undescribed species. The species is currently only known from one karst limestone locality. This restricted distribution conforms to regional patterns of speciation and endemism in the genus whereby species restricted to karst limestone have very restricted distributions and those found on other soil types have wider distributions.

Key Words. Bat Dai Son, karst limestone, taxonomy.

Introduction

Botanical exploration of the high mountains of northern Vietnam has been limited. Nevertheless, in recent years, progress has been made on our understanding of vascular plant diversity in Vietnam, with around 530 species having been described as new from the country between 2011 and 2017 (Middleton *et al.* 2019).

In 2014, a joint expedition to northern Vietnam was mounted by the Vietnamese Institute of Ecology and Biological Resources (IEBR), the Royal Botanic Garden Edinburgh, the Royal Botanic Gardens Kew, Longwood Gardens, and the University of British Columbia. The aim of the expedition was to collect a range of species distributed in north-western Vietnam, particularly on the Hoang Lien Son mountain range, for research and *ex situ* conservation. Material collected included living material, seed, herbarium specimens and DNA samples. Research on these collections is ongoing, with four new taxa having already been described (Möller *et al.* 2018; Baines *et al.* 2021). As plants brought into cultivation mature and flower, they will be studied and identified.

Northern Vietnam is at the south-eastern end of the Sino-Himalayan mountain range and is an important part of the Indo-Burma biodiversity hotspot (Critical Ecosystem Partnership Fund 2020). There are also phytogeographical affinities with the montane flora of south and south-eastern China, Laos, Cambodia and Thailand (Middleton *et al.* 2019). Within this region, there are a number of widespread species of *Wrightia* R.Br. There are also several local endemics, particularly in Thailand, which occur primarily on limestone (Middleton 2007; Middleton *et al.* 2019). Middleton *et al.* (2019) speculated that further local endemic species of *Wrightia* were likely to be found in Vietnam. A tree grown from seed collected on the 2014 expedition flowered in the Temperate House at the Royal Botanic Gardens, Kew in 2022. Material was collected and preserved as both herbarium and spirit specimens. This does not match any of the described species of *Wrightia*, so we formally describe it here as *Wrightia vietnamensis* Hazell & D.J.Middleton.

Wrightia is a genus of c. 30 species found in Africa, tropical and subtropical Asia and Australia (updated from Middleton 2014). As it has been revised throughout its range by Ngan (1965) and revised for Cambodia, Laos and Vietnam by Middleton (2014), there is good benchmark data against which new material can be assessed. Further formal publications, herbarium specimens and GBIF observations were consulted in the study of the material. Middleton (2010, 2014) noted that there is a pattern in *Wrightia* of species not found on limestone substrates tending to be rather widespread whereas species found on limestone tended to be rather locally endemic. *Wrightia vietnamensis*, only known from a karst limestone locality in Ha Giang Province, conforms to this general pattern.

This new species is similar to a number of other species described from limestone habitats in Thailand in recent years (Middleton 2007, 2010, 2014; Middleton & Santisuk 2001). It also has similarities to *Wrightia kwangtungensis* Tsiang from southern China and northern Vietnam in its antepetalous corona lobes toothed at the apex and having free carpels. However, *W. kwangtungensis* is characterised by having a pubescent inflorescence

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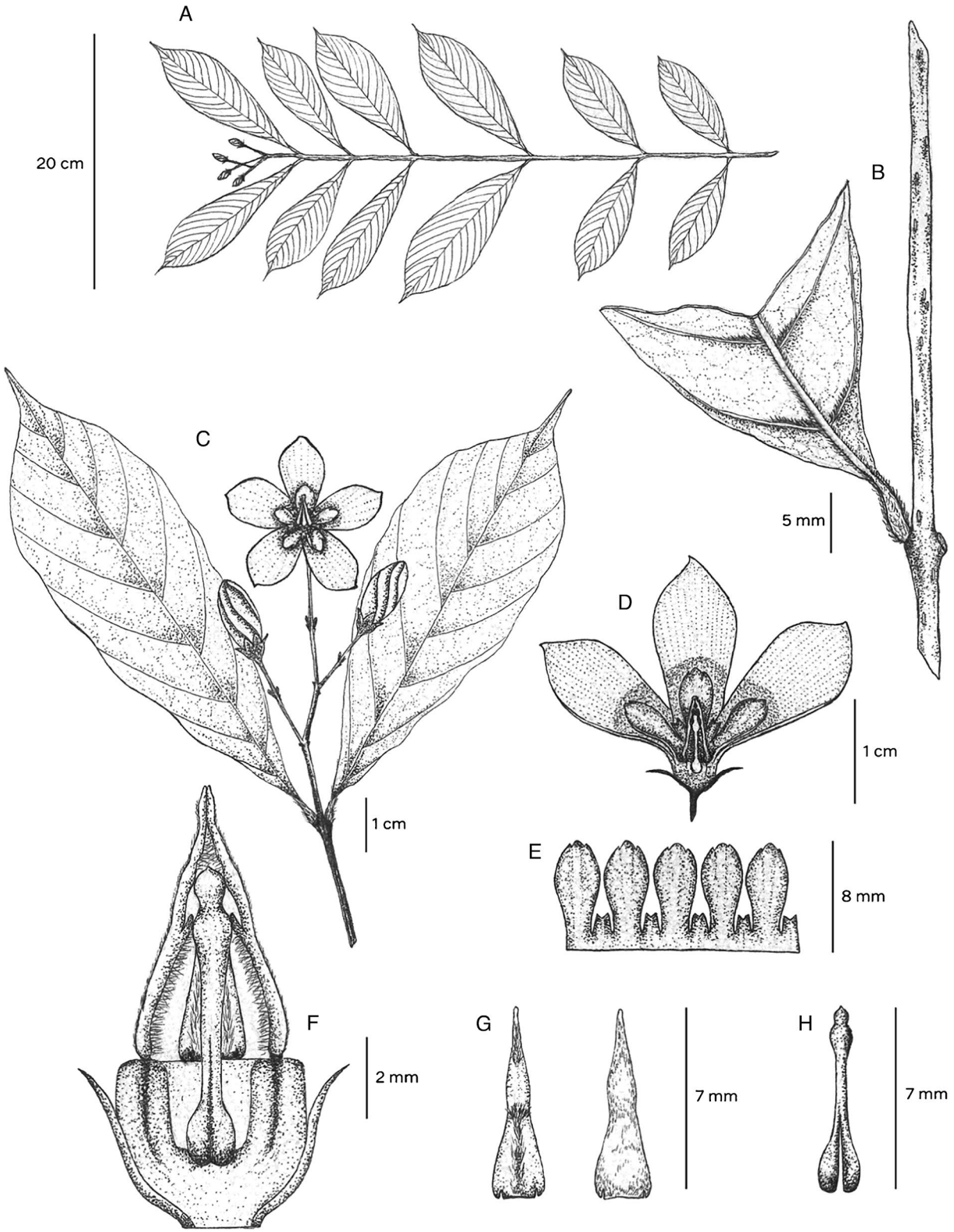

Fig. 1. *Wrightia vietnamensis*. **A** habit; **B** twig and base of leaf; **C** twig showing opposite leaves and terminal inflorescence; **D** dissected flower; **E** corona; **F** synorganisation of gynoecium and androecium; **G** anthers from the front and back; **H** pistil. DRAWN BY JESSICA FRANCIS.

Fig. 2. *Wrightia vietnamensis*. **A** habitat; **B** bark; **C** habit and flower; **D** fruit. PHOTOS: **A, D** RICHARD BAINES; **B, C** EMILY HAZELL.

and a corona in three whorls (antepetalous, alternipetalous and small alternating lobes) whereas *W. vietnamensis* has a glabrous inflorescence and only antepetalous and alternipetalous lobes always present, with alternating lobes only in some flowers or even inconsistently so in a single flower. Of the other species of *Wrightia* found in the region with free carpels, it differs from *W. laevis* Hook.f. by that species having a very much more divided corona and smaller flowers, from *W. lecomtei* Pit. by that species lacking antepetalous corona lobes, from *W. religiosa* (Teijsm. & Binn.) Benth. ex Kurz by that species lacking a corona entirely, and from *W. sikkimensis* Gamble by that species generally having slightly smaller flowers and entire corona lobes.

Taxonomic Treatment

Wrightia vietnamensis *Hazell & D.J.Middleton*, **sp. nov.** Type: Originally from Vietnam, Ha Giang Province, Bat Dai Son, 766 m, 23°09.109'N, 105°00.428'E, 6 Nov. 2014, *Baines et al.* HNE 271, grown on at RBG Kew as accession 2018-920, vouchered 11 July 2022 and selected as type as *Hazell* EH01 (holotype K, including spirit material).

http://www.ipni.org/urn:lsid:ipni.org:77323734-1

Tree to 5 m tall, 16 cm dbh. *Bark* grey-brown, lenticellate, rough with vertical fissures 0.5 – 2.3 cm long. *Twigs* glabrous or with very few crisped hairs below each node, sparsely lenticellate. *Latex* white. *Leaves* opposite; petiole 0.2 – 0.6 cm long, with sparse crisped hairs, these denser beneath; lamina elliptic to obovate, 7.6 – 12.8 (– 15) × 3 – 4.7 (– 6.2) cm, (2 –) 2.7 – 3 times as long as wide, apex acuminate, base cuneate, margin entire, slightly undulate, mid green above, paler beneath, glabrous above except for very few hairs on margin near base and at base of midrib, sparsely and minutely punctate above, glabrous beneath on lamina, with crisped hairs along each side of midrib and base of secondary veins, these becoming much sparser towards apex, venation weakly brochidodromous, 8 – 12 pairs of secondary veins, tertiary venation alternate percurrent. *Inflorescence* a terminal cyme, (2 –) 4 – 13-flowered, glabrous; peduncle to 19 mm long; pedicels 7 – 9 mm long; *flowers* with a smell of ham. *Sepals* pale green, ovate to triangular, (2 –) 3.6 – 5.5 × (1 –) 1.7 – 3 mm, quite variable within a single flower, apex acute to obtuse, glabrous to minutely papillose, margin ciliate; 2 squarish colleters at base of each sepal. *Corolla* salmon pink to pale orange, rotate, aestivation sinistrorse; tube (1 –) 3 mm long, glabrous; lobes elliptic, 13.5 – 19 × 7 – 10 mm, apex rounded, minutely papillose outside, shortly puberulent towards base, minutely papillose inside. *Corona* pale orange, of antepetalous and alternipetalous lobes, some flowers also with alternating lobes, these sometimes only few in a single flower, glabrous inside, minutely papillose outside; antepetalous lobes 5.5 – 8 mm long, c. 1/3 width of and adnate to corolla lobes for just over half their length, 2 – 3-toothed at apex; alternipetalous lobes in same plane as antepetalous, adnate to antepetalous lobes at base, 2 – 3 mm long, bifid; alternating lobes when present simple, c. 0.5 mm long, glabrous. *Stamens* 5, attached in a ring to the style head, inserted at the mouth of the corolla; filaments 1 – 1.5 mm long; anthers narrowly triangular, base sagittate, c. 6.7 – 7 × 1 – 2 mm, shortly puberulent dorsally. *Gynoecium* of two apocarpous ovaries united into a common style; ovaries 1.5 – 1.7 × 1 – 1.5 mm, glabrous; style + style head c. 6.5 – 6.7 mm long. *Fruit* of paired follicles, c. 15 cm long. Figs 1 and 2.

RECOGNITION. Similar to *Wrightia kwangtungensis* Tsiang in its antepetalous corona lobes toothed at the apex and having free carpels but differs in its glabrous inflorescence (pubescent in *W. kwangtungensis*), usually longer sepals ((2 –) 3.6 – 5.5 mm long in *W. vietnamensis*, c. 2 mm in *W. kwangtungensis*), shorter alternipetalous corona lobes (2 – 3 mm long in *W. vietnamensis*, c. 5.2 mm long in *W. kwangtungensis*).

DISTRIBUTION. Vietnam. Ha Giang Province: Bat Dai Son, 766 m.

SPECIMENS EXAMINED. VIETNAM. HA GIANG PROVINCE: Bat Dai Son, 766 m, 23°09.109'N, 105°00.428'E, 6 Nov. 2014, *Baines et al.* HNE 271 (source of seeds for RBG Kew accessions 2015-0588, 2018-920) (HN, K).

HABITAT. Temperate and humid montane hillside, in wet, thin soil with high humus content over karst limestone. The surrounding vegetation is characterised by *Rhododendron, Callicarpa* and *Trichosanthes* spp.

CONSERVATION STATUS. Data Deficient (DD) (IUCN Standards and Petitions Committee 2019). One population was discovered at the side of a path at Bat Dai Son.

PHENOLOGY. The above description has been prepared from cultivated plants grown at the Royal Botanic Gardens, Kew from seeds collected in the wild in November 2014 [Fruiting in November]. The normal flowering time under glass in London, U.K., is early July.

ETYMOLOGY. The species is named after the country in which it was first collected.

CULTIVATION. *Wrightia vietnamensis* should be grown in full sun, ideally in a sheltered position exposed to minimum frost or in a protected environment. It requires damp soils that are free draining but high in organic matter. When grown from seed it can produce flowers after six years.

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Declarations

Conflicts of interest The authors declare that they have no conflict of interest.

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