



Alangium confertiflorum, a new species of *Alangium* sect. *Alangium* (Cornaceae) from China-Laos transboundary region

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ABSTRACT: *Alangium confertiflorum* Y.H.Tan & H.B.Ding, a new species of *Alangium* section *Alangium* (Cornaceae) from China-Laos transboundary region, is described and illustrated here. The similarities and differences with closest allied species in the section *Alangium*, *A. amplum* W.J.de Wilde & Duyfjes and *A. indochinense* W.J.de Wilde & Duyfjes are discussed. The new species is assessed as Endangered (EN) following the IUCN Red List Categories and Criteria.

KEY WORDS: *Alangium confertiflorum*, *Alangium amplum*, *Alangium indochinense*, taxonomy.

INTRODUCTION

Alangium Lam. (in Lamarck, 1783: 174) (Cornaceae) has approximately 55 species mostly distributed in tropical and subtropical regions of eastern and southeastern Asia, extending to most of the western and southwestern Pacific Islands and eastern Australia (Feng *et al.*, 2009; De Wilde and Duyfjes, 2016, 2017a, 2017b). The section *Alangium* is one of the four sections recognized in *Alangium* by Bloembergen (1935, 1939), his division into sections was later corroborated with molecular data (Feng *et al.*, 2009). The section *Alangium* is characterized by flowers with stamens two or more times the number of petals and compound inflorescences (Feng *et al.*, 2009; De Wilde and Duyfjes, 2016). In recent years, 4 new species and 1 new variety in section *Alangium* have been described, namely *A. amplum* W.J.de Wilde & Duyfjes (2016: 78), *A. frutescens* Zoll. & Mor. var. *palawanense* W.J.de Wilde & Duyfjes (2016: 79), *A. indochinense* W.J.de Wilde & Duyfjes (2016: 80), *A. melliferum* W.J.de Wilde & Duyfjes (2016: 85) and *A. sempervirens* W.J.de Wilde & Duyfjes (2016: 86). So far, the section *Alangium* comprises 11 species (and 2 varieties) (De Wilde and Duyfjes, 2016). Eleven species are currently known from China (Qin and Phengklai, 2007; De Wilde and Duyfjes, 2016), of which only two species (*A. salviifolium* (L.f. (1782: 409)) Wangerin (1910: 9) and *A. indochinense*) belong to *A.* section *Alangium*.

The new species presented here as *Alangium confertiflorum* (*A.* section *Alangium*) was collected in 2013 by the authors during floristic surveys of southern

Yunnan, and was subsequently collected from several other locations in southern Yunnan, China and another location in Laos in 2019. It is described below and compared to *A. amplum* W.J.de Wilde & Duyfjes (2016: 78); however, comparison to *A. indochinense* W.J.de Wilde & Duyfjes (2016: 80) is also provided. The description of the new species is based on living flowering material and specimens from the type collection.

TAXONOMIC TREATMENT

Alangium confertiflorum Y.H.Tan & H.B.Ding, *sp. nov.*
密花八角枫 Fig. 1

Type: CHINA. Yunnan Province: Mengla County, Xishuangbanna National Nature Reserve, 21°41'38" N, 101°31'54" E, alt. 910 m, 23 April 2019, Y.H. Tan, B. Yang, H.B. Ding, X.D. Zeng, D.L. Quan, G. Yan & S.H. You T0456 (holotype: HITBC! [0030007], isotypes: HITBC! [0030008], HITBC! [0030009]).

Diagnosis: The new species is similar to *A. amplum* W.J.de Wilde & Duyfjes with its scandent habit, the inflorescences axillary to extant foliage leaves and straight filaments (without hairy knob), but *A. confertiflorum* differs by the presence of spines on the main stem or the twigs (vs. spines absent), longer pedicels (3–7 mm long vs. 2.5 mm long), longer petals (20–22 mm long vs. 16 mm long), glabrous filaments (vs. with some hairs in lower half).

Description: Scandent shrub, spines on the main stem or the twigs. Twigs 3–5 mm diam., bark pale brown, densely puberulent and with scattered lenticels. **Leaves:**



Fig. 1. *Alangium confertiflorum*. A. Habit (flowering); B. Habit (fruiting); C. Spines on the stem; D. Flowering branch; E. Inflorescences; F. Fruits; G. Leaves; H. Domatia; I. Flowers; J. Petals; K. Stamens; L. Pedicel, ovary, calyx, style and stigma; M. Bracteoles; N. Fruit; O. Section of fruit; P. Seed. (Photographed by H.B. Ding).

**Table 1.** Morphological comparison of *A. confertiflorum*, *A. amplum* and *A. indochinense*.

Characters	<i>A. confertiflorum</i>	<i>A. amplum</i>	<i>A. indochinense</i>
Habit	Scandent shrub	climber	Shrub or tree
Spines	spines on the main stem or the twigs	not seen	long spines on the twigs and suckers
Domatia	obvious	obvious	inconspicuous or absent
Inflorescences	axillary to extant foliage leaves or to leaf scars	axillary to extant foliage leaves	on bare twigs
Number of flowers	several- or many -flowered	several- or many -flowered	5–20 flowers
Flowers	white or cream-yellow	white	white
Pediceal	3–7 mm long	ca. 2.5 mm long	1–5 mm long
Petals	6 or 7; 20–22 mm long	6; ca. 16 mm long	6 or 7 (-10); 10–18 mm long
Stamens	14 or 12,	14	12–20
Filaments	Straight without hairy knob glabrous	Straight without hairy knob some hairs in lower half	Geniculate with a hairy knob hairy in the basal part
Fruits	ripening red	not seen	ripening purple-black

petiole 0.7–1.7 cm long; lamina glabrous on upper surface, sparsely hairs on lower surface, domatia present; elliptic or oblong, broadest above the middle, 7.0–16 × 3.0–5.7 cm, base obtuse to rounded, slightly asymmetric, apex caudate; veins prominent on lower surface, 3-plinerved at base, reaching to about halfway the blade, lateral veins 3–5 on each side, intercostal venation scalariform-reticulate. **Inflorescences:** subsessile, axillary to extant foliage leaves or to leaf scars, all densely pale brown hairy, compact, several- or many -flowered, terminal bud not obvious. **Flowers:** pedicel 3–7 mm long, densely hairy, with 3 minute bracteoles, 2 at base and 1 at apex; ovary and calyx 3–4 mm long, densely hairy, limb ca. 4 mm wide, 6 or 7 lobed, lobes ca. 0.5 mm long, acute; petals 6 or 7, white or cream-yellow, abaxially short-hairy, adaxially glabrous, 2.0–2.2 cm long; stamens 14 or 12, 17–18 mm long, **filaments** 6–7 mm long, white, straight and glabrous (without hairy knob), anthers 10–11 mm long, white or cream-yellow, glabrous, style glabrous, 2.0–2.2 cm long, stigma capitate, ca. 2.3 mm wide. **Fruits:** 2 or 3 per infructescence, ripening red, short-hairy, faintly ridged, subglobose, 2.2–2.5 cm diam., persistent calyx ca. 1 mm high, ca. 2.5 mm wide. **Seed** 1, ellipsoid, ca. 1.8 × 1.1 cm, dark brown.

Phenology: Flowering April to May, fruiting July.

Etymology: The specific epithet refers to the crowded flowers in the inflorescence.

Habitat and distribution: *Alangium confertiflorum* is known from southern Yunnan, China and northern Laos. It grows in the understory of evergreen broadleaved forest and tropical rainforest at 900–1100 m elevation.

Conservation status: It is known from China-Laos transboundary area, four of the seven currently known locations occur in protected areas, and a total of less than one hundred individuals were found in the wild. The Area of Occupancy (AOO) is 28 km² and Extent of Occurrence (EOO) is 1,540.835 km² based on the current data (Fig. 2). Nearly half of the locations remain out of protected areas. The population is decreasing due to forests fragmentation and habitat degradation, so we

suggest the species is therefore assessed as ‘Endangered’, (EN B2ab(i, ii, iii, iv) IUCN 2017).

Additional specimens examined (paratypes): CHINA.

Yunnan Province: Mengla County, Xishuangbanna National Nature Reserve, 21°41'38" N, 101°31'54" E, alt. 910 m, 27 July 2019, *B. Yang, H.B. Ding, X.D. Zeng, P.Y. Wang, Z.L. Gan & S.H. You T0457* (HITBC0030010, HITBC0030011, HITBC0030012); Mengla, Bubeng, tropical seasonal rainforest, 21°36'31" N, 101°35'8" E, alt. 700 m, 16 April 2013, *J.W. Li & Y.H. Tan 3019* (HITBC, TAD); Mengla, Yiwu, tropical seasonal rainforest, 21°59'58" N, 101°31'2" E, alt. 900 m, 1 May 2016, *J.W. Li 4548* (HITBC, KUN, K); Mengla, Mengban, Hongwei, Xishuangbanna National Nature Reserve, 21°43'39" N, 101°42'59" E, alt. 967 m, 20 April 2019, *Y.H. Tan, B. Yang, H.B. Ding, X.D. Zeng, D.L. Quan, G. Yan & S.H. You G2-0046* (HITBC); Mengla County, Guanlei town, Mengyuan village, Xishuangbanna National Nature Reserve, 21°42'29" N, 101°22'56" E, alt. 740 m, 25 April 2019, *Y.H. Tan, B. Yang, H.B. Ding, X.D. Zeng, D.L. Quan, G. Yan & S.H. You G2-257* (HITBC); Mengla County, Guanlei town, Mengyuan village, Xishuangbanna National Nature Reserve, 21°46'19" N, 101°24'25" E, alt. 967 m, 8 May 2019, *B. Yang, H.B. Ding, X.D. Zeng, D.L. Quan, G. Yan & S.H. You G2-373* (HITBC). **LAOS.** Louang Namtha Province, Nam Kong Village, Nam Ha National Bio-Diversity Protected Area, 21°11'50" N, 101°25'33" E, alt. 1092 m, 4 April 2019, *Y.H. Tan, B. Yang, H.B. Ding, X.D. Zeng & D.L. Quan L0988* (HITBC, HNL).

Note: In its scandent habit and straight (without hairy knob) filaments, *A. confertiflorum* is similar to *A. amplum*, but differs in having glabrous filaments (vs. some hairs in lower half), longer petals (20–22 mm long vs. ca. 16 mm long), occasionally spines on the main stem or the twigs (vs. spines absent). Considering the geographical distribution, a comparison to *A. indochinense* is also provided in Table 1.

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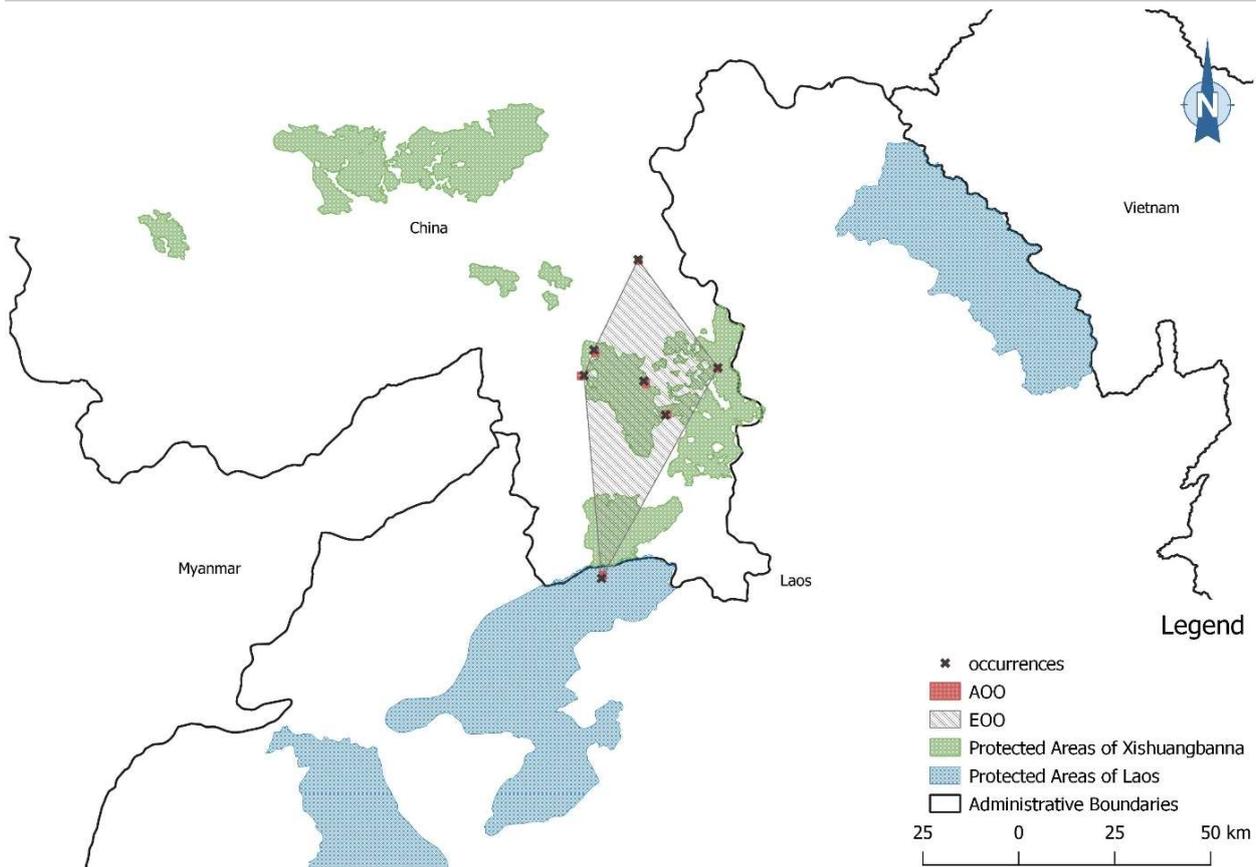


Fig. 2. The distribution of *Alangium confertiflorum*.

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