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The Lauraceae Juss. of Indo-China: fifteen new species, four new combinations and two neotypifications

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ABSTRACT
Fifteen new species of Lauraceae Juss. from Indo-China are described: *Actinodaphne kontumi* de Kok, sp. nov.; *Cinnamomum auricolor* Kosterm. ex de Kok, sp. nov.; *Cinnamomum inconspicuum* Kosterm. ex de Kok, sp. nov.; *Cinnamomum kostermannii* de Kok, sp. nov.; *Cinnamomum damhaense* Kosterm. ex de Kok, sp. nov.; *Cinnamomum petelotii* Kosterm. ex de Kok, sp. nov.; *Cinnamomum scalarinervium* Kosterm. ex de Kok, sp. nov., *Litsea banaensis* de Kok, sp. nov.; *Litsea honbaensis* de Kok, sp. nov.; *Litsea nhatrangensis* de Kok, sp. nov.; *Litsea rubrobrunnea* de Kok, sp. nov.; *Litsea salmonea* A.Chev. ex de Kok, sp. nov.; *Machilus coriacea* A.Chev. ex de Kok, sp. nov.; *Neocinnamomum huongsonensis* Kim Dao, sp. nov. and *Phoebe petelotii* Kosterm. ex de Kok, sp. nov. In addition, four new combinations are made: *Actinodaphne cambodiana* (Lecomte) de Kok, comb. nov.; *Actinodaphne rehderiana* (C.K.Allen) de Kok, comb. nov.; *Actinodaphne sesquipedalis* subsp. *cambodiana* (Lecomte) de Kok, comb. nov, stat. nov. and *Dehaasia ferruginea* (H.Liou) de Kok, comb. nov., two names are lectotypified and two are second stepped lectotypifications.

KEY WORDS
Lauraceae,
Vietnam,
Laos,
Cambodia,
neotypifications,
lectotypifications,
new combinations,
new status,
new species.

RÉSUMÉ
Les Lauraceae Juss. d'Indo-Chine : quinze espèces nouvelles, quatre combinaisons nouvelles et deux néotypifications.
Quinze espèces nouvelles de Lauracées d'Indochine sont décrites : *Actinodaphne kontumi* de Kok, sp. nov. ; *Cinnamomum auricolor* Kosterm. ex de Kok, sp. nov. ; *Cinnamomum inconspicuum* Kosterm. ex de Kok, sp. nov. ; *Cinnamomum kostermannii* de Kok, sp. nov. ; *Cinnamomum damhaense* Kosterm. ex de Kok, sp. nov. ; *Cinnamomum petelotii* Kosterm. ex de Kok, sp. nov. ; *Cinnamomum scalarinervium* Kosterm. ex de Kok, sp. nov., *Litsea banaensis* de Kok, sp. nov. ; *Litsea honbaensis* de Kok, sp. nov. ; *Litsea nhatrangensis* de Kok, sp. nov. ; *Litsea rubrobrunnea* de Kok, sp. nov. ; *Litsea salmonea* A.Chev. ex de Kok, sp. nov. ; *Machilus coriacea* A.Chev. ex de Kok, sp. nov. ; *Neocinnamomum huongsonensis* Kim Dao, sp. nov. et *Phoebe petelotii* Kosterm. ex de Kok, sp. nov. En outre, quatre nouvelles combinaisins sont effectuées : *Actinodaphne cambodiana* (Lecomte) de Kok, comb. nov. ; *Actinodaphne rehderiana* (C.K.Allen) de Kok, comb. nov. ; *Actinodaphne sesquipedalis* subsp. *cambodiana* (Lecomte) de Kok, comb. nov, stat. nov. et *Dehaasia ferruginea* (H.Liou) de Kok, comb. nov., deux noms sont lectotypifiés et les lectotypes de deux autres sont précisés.

MOTS CLÉS
Lauraceae,
Vietnam,
Laos,
Cambodge,
néotypifications,
lectotypifications,
combinaisons nouvelles,
statut nouveau,
espèces nouvelles.

INTRODUCTION

The species of Lauraceae Juss. have been revised for the *Flora of Laos, Cambodia and Vietnam* and in this new account 21 genera and 185 species are recognised. In the past, this family has not received much attention in this region. The first treatment was by Lecomte (1913), whose paper in preparation for his flora account recognised 13 genera and 100 species, although in the Flore Générale de L'Indo-Chine, published a year later, he recognised 12 genera and 71 species (Lecomte 1914). Since then, a small number of botanists have worked on the family, the most important one being Liou Ho, who published his PhD thesis on the Lauraceae of Indo-China and South China in 1932. He recognised 14 genera and 82 species for Indo-China. Other important contributions were made by Caroline Allen, who wrote several papers (Allen 1938, 1939 & 1941) mainly on the genera *Actinodaphne* Nees, *Cinnamomum* Schaeffer, *Litsea* Lam., *Lindera* Thunb., *Neocinnamomum* H.Liou and *Neolitsea* (Bentham & J.D. Hooker) Merr.

Kostermans wrote an account, a copy of which is kept in the Kostermans archives at L, of the species of *Cinnamomum* for the region in the 1980's, but never published it. However, the new names he proposed were used by him on many identification labels on herbarium sheets in several herbaria. These names have since entered the literature, mostly without being validly published, and some of them are validated here. The French botanist A. Chevalier also published several invalid names, but most of those have subsequently been validated by various authors.

In the *Illustrated Flora of Vietnam* (Hô 1999), 17 genera and 241 species were recognised, whereas the recent account in the Flora of Vietnam (Nguyễn Kim Đào 2017) recognised 21 genera, 273 species, 32 subspecies and two forms.

Several generic accounts have been published for the region: *Neocinnamomum* (Kostermans 1974a), *Caryodaphnopsis* (Kostermans 1974b), *Cinnadenia* Kosterm. (de Kok & Sengun 2020), *Cryptocarya* R. Br. (de Kok 2015) and *Beilschmiedia* (de Kok 2021), *Machilus* Rumphius ex Nees (Yahara *et al.* 2016 & Mase *et al.* 2020) and several new species of *Cinnamomum* and one *Lindera* has been described recently (Tagane *et al.* 2015; de Kok 2019) as well as updates to checklist (Tagane *et al.* 2020).

The aim of this paper is to describe a number of additional new species discovered during the research for the forthcoming flora account, to validate several names that have not previously been validly published, and to make some new taxonomic combinations. For all other species in the region, full descriptions, keys and notes on distribution and ecology will be given in the forthcoming account in the Flora of Laos, Cambodia and Vietnam.

MATERIAL AND METHODS

The revisions for the account for the Flora of Laos, Cambodia and Vietnam are based on herbarium collections from these countries that are housed at BO, BKF, BM, E, K, KEP, L, P, QBG and SING. In the species descriptions, all measurements and colour descriptions are from mature material; all measurements and information about the position of the veins relative to the remainder of the leaf are taken from dried material. All collections cited have been seen by the author. Type material not available at institutions visited by the author was studied online via JSTOR (https://plants.jstor.org/plants) and accessed in January 2021. For the conservation assessments, all Areas of Occupancy (AOO) and Extents of Occurrence (EOO) were calculated using the standard settings of the GeoCAT (http://geocat.kew.org) from January to March 2021.

NEW SPECIES

Family Lauraceae Juss.
Genus *Actinodaphne* Nees

1. ***Actinodaphne kontumi*** de Kok, sp. nov.
(Figs 1; 2)

Actinodaphne reticulata var. *reticulata sensu* Nguyễn Kim Đào, *Flora of Vietnam* 20: 420 (Nguyễn Kim Đào 2017).

Actinodaphne reticulata var. *glabra sensu* Nguyễn Kim Đào, *Flora of Vietnam* 20: 421 (Nguyễn Kim Đào 2017).

Diagnosis. —This species differs from its close relative *Actinodaphne perlucida* C.K. Allen by having leaves that are thinly leathery (rather than thickly leathery in *A. perlucida*) with the midrib raised on the upper surface (rather than sunken in *A. perlucida*) and the petiole 6-15 mm long (rather than 10-20 mm long in *A. perlucida*).

Type specimen. — **Vietnam**. Kon-Tum, Massif du Ngok Pan, 9.XII.1946, *Poilane 35755* (holo-, P[P02035722]).

Distribution. — **Vietnam**. Kon-Tum and Gia Lai provinces (Fig. 2). This species has also been recorded from the Vietnamese provinces of Ha Giang, Vinh Phuc and Thua Thien-Hue as *Actinodaphne reticulata* var. *reticulata* and *Actinodaphne reticulata* var. *glabra* (see Nguyễn Kim Đào [2017]), but specimens on which these records are based have not been seen by the author.

Ecology. — This species is known from upland forest over granite, between 800-2000 m altitude. Flowering in December; fruiting time unknown.

Conservation assessment. — Endangered (EN B1ab(i,iii), B2ab(ii,iii)). This species is only definitely known from a small number of collections from a few localities in the Kon-Tum and Gia Lai Provinces of Vietnam. An analysis of the Extent of Occurrence (EOO) and Area of Occupancy (AOO) gives an IUCN Conservation Assessment of Endangered. Given that it is only known from three populations and has small area of occupancy as well as the intensive logging and landscape modification that has occurred in the region during the last 50 years, this species must be considered endangered.

Additional collections seen. — **Vietnam**. Kon-Tum: Massif du Ngok Pan, 9.XII.1946, *Poilane 35754* (P[P02035820]); Massif du Ngok Pan, 18.XII.1946, *Poilane 35936* (P); Massif du Ngok Pan, alt. 2000 m; 18.XII.1946, *Poilane 35943* (P[P02035701]); Dak Gley, 6.XII.1995, *Averyanov et al. VH 2382* (P). — Gia Lai: K'Bang, So' Pai, 16.V.1998, *Willis 30* (K).

Fig. 1. — *Actinodaphne kontumi* de Kok, sp. nov.: **A**, twig with leaves and inflorescence; **B**, infructescence and fruit; **C**, detail of leaf under surface. All from *Poilane 35755* (P02035722). Drawing by Giulia Iaconelli. Scale bars: A, 5 cm; B, 1 cm; C, 0.5 cm.

Description

Tree or shrub 3-20 m tall, dbh 20-33 cm. Twigs slender, 1.6-2.3 mm thick, rounded in cross-section, sparsely to densely hairy when young, glabrescent; terminal leaf bud 1-1.7 mm long, apex rounded to acute, sparsely hairy, scales imbricate. Leaves in pseudo-whorls of 4-5; leaf blade elliptic to (ob) lanceolate, 6.3-10(–22) × 1.6-5 cm, apex acuminate, base cuneate, thinly leathery, penninerved, secondary nerves 7-15 pairs, brochidodromous, tertiary nerves scalariform-reticulate,; upper surface glabrous, shiny, midrib raised, secondary nerves raised, tertiary nerves distinct; lower surface glaucous, glabrous, midrib and secondary nerves raised, tertiary nerves indistinct; petiole half terete, 6-15 mm long, slender, slightly hairy.

Inflorescences 3-5 mm long, umbellate, axillary and internodal, densely hairy; bracts 1-2 mm long, apex acute, sparsely hairy. Flowers: cream male flowers with perianth lobes elliptic, 2.3-2.5 × 1.1-1.6 mm, apex acute, sparsely hairy inside and outside; stamens 3.7-4 mm long, hairy, anthers 4-celled; female flowers with perianth lobes elliptic, 1.9-2.3 × 1-1.3 mm, apex acute, sparsely hairy inside and outside; ovary *c.* 1.1 mm diameter, glabrous.

Fruits (imperfectly known) ellipsoid, 10-12 × 7-8 mm, apex acute; cupule only covering the base (see Fig. 1).

Genus *Cinnamomum* Schaeff.

2. ***Cinnamomum auricolor***
Kosterm. ex de Kok, sp. nov.
(Fig. 2)

Cinnamomum auricolor Kosterm., unpublished; P.H. Hô, *Illustrated Flora of Vietnam*: 433 (Hô 1991), *nom. inval.*; Nguyễn Kim Đào, Lauraceae *in Checklist of Plant Species of Vietnam* 2: 73 (Nguyễn Kim Đào 2003), *nom. inval.*

Diagnosis. — This species differs from all south east Asian *Cinnamomum* species by having leaves with appressed reddish hairs on the lower surface.

Type specimens. — [**Vietnam**, Son-Tay]. Mt Bavi, [21°3'45"N, 105°21'38.016"E], alt. 800-1200 m, 2.VI.1918, *Fleury 37819* (holo-, P[P01964577]; iso-, L[L0035706, L0035707]).

Distribution. — Only known from the type specimen from Mt Bavi, Vietnam (Fig. 2).

Ecology. — Growing between 800-1200 m altitude. Flowering in June; fruiting time unknown.

Conservation assessment. — Critically Endangered (CR B1ab(i,iii), B2ab(ii,iii)). As this species is known from only one collection, from Mt Bavi in Vietnam, an IUCN Conservation Assessment of Critically Endangered is appropriate.

Description

Tree up to 20 m tall, dbh *c.* 50 cm. Twigs slender to stout 3.4-6 cm thick, angular in cross-section, sparsely hairy when young, glabrescent; hairs yellowish, appressed; terminal leaf bud ovoid, 3-4 mm long, apex acute, velutinous. Leaves subopposite, domatia absent; blade elliptic to lanceolate, 5.5-7.5 × 2.2-3 cm, apex long acuminate, base cuneate, blade leathery, triplinerved, secondary nerves extending to leaf tip, brochidodromous, sometimes with a false side vein, tertiary nerves scalariform; upper surface sparsely hairy on major nerves and at base, midrib and secondary nerves sunken to raised, tertiary nerves indistinct; lower surface reddish brown when dried, sparsely hairy, midrib and secondary nerves raised, tertiary nerves distinct; hairs reddish, appressed; petiole half terete, 11-15 cm long, slender, sparsely hairy.

Inflorescence 1-10 cm long, a few flowered panicle, axillary, densely to sparsely hairy; hairs yellowish, appressed; bracts leaf-like; bracteoles elliptic, 2-2.4 mm long, apex acute, sparely hairy, caducous. Flowers immature, with reddish appressed hairs.

Fruit unknown.

Notes

No evidence that this name was ever validly published could be found and so it is validated here. Although it is generally not a good idea, especially in the Lauraceae, to published new species based on incomplete material (in this case lacking fruits and with only immature flowers), this species is clearly a *Cinnamomum* based on the immature flowers (number of perianth lobes and stamens) and the orientation (subopposite) and venation (triplinerved) of the leaves. Within the genus it is unique because of the reddish appressed hairs on the lower leaf surface.

3. ***Cinnamomum inconspicuum***
Kosterm. ex de Kok, sp. nov.
(Figs 2; 3)

Cinnamomum inconspicuum Kosterm., unpublished; P.H. Hô, *Illustrated Flora of Vietnam*: 428 (Hô 1991), *nom. inval.*; Nguyễn Kim Đào, Lauraceae *in Checklist of Plants Species of Vietnam* 2: 76 (Nguyễn Kim Đào 2003 *nom. inval.*); Nguyễn Kim Đào, *Flora of Vietnam* 20: 283 (Nguyễn Kim Đào 2017), *nom. inval.*

Diagnosis. — This species differs from its close relative *Cinnamomum bokorense* Tagane & Yahara by having thinly leathery leaves (rather than rigidly leathery in *C. bokorense*) and by having perianth lobes that are very sparsely hairy on the outside (vs densely hairy in *C. bokorense*).

Type specimen. — [**Vietnam**] Quang Nam: près du village Moi de Mang Tra, [15°3'52.776"N, 108°9'32.796"E], alt. 1500 m, 26.II.1941, *Poilane 31790* (holo-, P[P01964441]).

Distribution. — Vietnam and Cambodia (see Fig. 2).

Ecology. — Growing in forests on granite-derived soil at 150-1500 m altitude. Flowering February to March.

Conservation assessment. — Endangered (EN B1ab(i,iii), B2ab(ii,iii)). This species is known only from three localities in Cambodia and Vietnam. An analysis of the Extent of Occurrence (EOO) and Area of Occupancy (AOO) gives an IUCN Conservation Assessment of Endangered.

Additional collections seen. — **Cambodia**. Phnom Penh: Forêt de Phnom Penh, 4.II.1935, *Béjaud s.n.* (P). — Pursat: Anlong Krauch, [12°15'15.012"N, 104°2'45.996"E], alt. 150 m, 28.XII.1968, *Martin 395bis* (P[P02006706]).

Description

Tree. Twigs slender, 1.1-3.4 mm thick, rounded in cross-section, glabrous; terminal leaf bud linear, *c.* 2.8 mm long, apex acute, sparsely hairy. Leaves alternate to (sub)opposite, domatia absent; blade lanceolate, 7.5-10 × 1.7-3 cm, apex acute to acuminate, base cuneate, thinly leathery, triplinerved, secondary nerves one pair, tertiary nerves scalariform; upper surface glabrous, midrib and secondary nerves raised, tertiary nerves indistinct; lower surface glabrous, midrib and secondary nerves raised, tertiary nerves indistinct; petiole channelled, 5-7.5 mm long, slender, glabrous.

Inflorescence 5-6.5 cm long, a few-flowered panicle, terminal, glabrous; bracts absent; bracteoles linear, 1-1.2 mm long, apex acute, sparsely hairy. Flower with perianth tube shallow, perianth lobes 1.5-1.6 × 1-1.2 mm, apex acute, very sparsely hairy; stamens 1.5-2.7 mm long, hairy, anthers 4-celled; ovary ellipsoid, *c.* 1.2 mm diameter, glabrous, style *c.* 1.3 mm long.

Fruit unknown (see Fig. 3).

Notes

No evidence that this name was ever validly published could be found and so it is validated here.

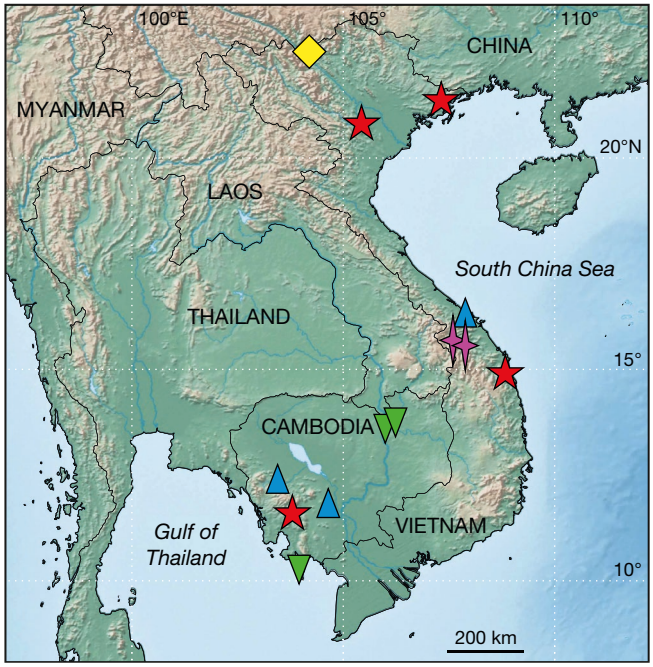

Fig. 2. — Distribution of *Actinodaphne kontumi* de Kok, sp. nov. (✦), *Cinnamomum auricolor* Kosterm. ex de Kok, sp. nov. (◇), *Cinnamomum inconspicuum* Kosterm. ex de Kok, sp. nov. (▲), *Cinnamomum kostermannii* de Kok, sp. nov. (▼) and *Cinnamomum damhaense* Kosterm. ex de Kok, sp. nov. (★).

4. ***Cinnamomum kostermannii*** de Kok, sp. nov. (Figs 2; 4)

Cinnamomum longepetiolatum Kosterm. unpublished; P.H. Hô, *Illustrated. Flora of Vietnam*: 429 (Hô 1991), *nom. inval.*; Nguyễn Kim Đào, Lauraceae *in Checklist of Plant Species of Vietnam* 2: 77 (Nguyễn Kim Đào 2003), *nom. inval.*; Nguyễn Kim Đào, *Flora of Vietnam* 20: 282 (Nguyễn Kim Đào 2017) *nom. inval.*

Diagnosis. — This species differs from its close relative *Cinnamomum heyneanum* Wall. ex Nees by having twigs with yellowish appressed hairs (vs whitish erect hairs in *C. heyneanum*), terminal leaf buds that are ovoid and 2.8-3.3 mm long (vs linear and 0.8-1.9 mm long in *C. heyneanum*) and glabrous lower leaf surfaces (vs sparsely hairy in *C. heyneanum*).

Type specimens. — **Cambodia**. Stung Treng, Angleng Veng, 13°43'15.996"N, 106°7'5.988"E, 16.XI.1927, *Poilane 14057* (holo-, P[P04023107]; iso-, P[P04023108]).

Vernacular name. — Cambodian: *Dang Dao* (*Poilane 14158*).

Distribution. — Known from Phu Quoc island in Vietnam (Nguyễn Kim Đào 2017: 282) and Stung Treng province in Cambodia (Fig. 2).

Ecology. — Grows in forests between 400-500 m altitude. Flowering in November; fruiting time unknown.

Conservation assessment. — Endangered (EN B1ab(i,iii), B2ab(ii,iii)). This species is known only from two localities in Cambodia and one in Vietnam. An analysis of the Extent of Occurrence (EOO) and Area of Occupancy (AOO) gives an IUCN Conservation Assessment of Endangered.

Additional collections seen. — **Cambodia**. Stung Treng: Changoun, 14°24'0"N, 104°46'59.988"E, 25.XI.1927, *Poilane 14158* (P[P01991864]).
Vietnam.Phu Quoc: Kien Giang, *Ban 118* (HN not seen).

Description

Tree 10-12 m tall, dbh *c.* 20 cm. Twigs slender 1.5-3 mm thick, rounded in cross-section, sparsely hairy, glabrescent; hairs yellowish, appressed; terminal leaf bud ovoid, 2.8-3.3 mm long, apex acute, velutinous. Leaves alternate, domatia absent; blade elliptic to lanceolate, 8.5-13 × 2.8-4.6 cm, apex acuminate, base cuneate, triplinerved, secondary nerves one pair, tertiary nerves scalariform; upper surface glabrous, midrib and secondary nerves raised, tertiary nerves indistinct; lower surface glabrous, midrib and secondary nerves raised, tertiary nerves indistinct; petiole half-terete, 7-25 mm long, slightly swollen, glabrous.

Inflorescence 15-20 cm long, a few-flowered panicle, internodal; bract leaf-like; bracteoles caducous. Flowers with perianth tube shallow; perianth lobes 2.9-3.2 × 1.6-1.7 mm, apex acute, sparsely hairy; stamens 1.3-2 mm long, hairy, anthers 4-celled; ovary globose, 1.6 mm diameter, glabrous; style *c.* 1.4 mm long.

Fruit unknown (see Fig. 4).

Notes

This new name replaces the epithet *Cinnamomum longepetiolatum* Kosterm. which was never validly published and given that this epithet is now occupied by *Cinnamomum longipetiolatum* H.W. Li (1975), this species is given a new name.

Fig. 3. — Plate of *Cinnamomum-inconspicuum* Kosterm. ex de Kok, sp. nov.: **A**, twig with leaves and inflorescence; **B**, detail of inflorescence apex; **C**, detail of leaf under surface. All from *Béjaud 742* (P02006697). Drawing by Giulia Iaconelli. Scale bars: A, 5 cm; B, 1 cm; C, 0.5 cm.

Fig. 4. — Holotype of *Cinnamomum kostermannii* de Kok, sp. nov., held at the Muséum national d'Histoire naturelle in Paris (P04023107).

5. *Cinnamomum damhaense* Kosterm. ex de Kok, sp. nov. (Figs 2; 5)

Cinnamomum damhaense Kosterm., unpublished; P.H. Hô, *Illustrated Flora of Vietnam*: 433 (Hô 1991), *nom. inval.*; Nguyễn Kim Đào, Lauraceae *in Checklist of Plant Species of Vietnam* 2: 76 (Nguyễn Kim Đào 2003), *nom. inval.*; Nguyễn Kim Đào, *Flora of Vietnam* 20: 289 (Nguyễn Kim Đào 2017), *nom. inval.*

Diagnosis. — This species differs from its close relative *Cinnamomum bokorense* Tagane & Yahara by having elliptic leaves (vs elliptic to lanceolate leaves in *C. bokorense*), and by having perianth lobes that are very sparsely hairy outside (vs densely hairy in *C. bokorense*).

Type specimen. — [**Vietnam**] Đà Nẵng, Ba-na, près de Tourane, 15°59'51.864"N, 107°59'17.088"E, alt. 1000-1500 m, 28.II.1939, *Poilane 29158* (holo-, P[P02132189]; iso-, P[P00790091]).

Distribution. — Vietnam and Cambodia (Fig. 2).

Ecology. — Growing on granite-derived soil between 1000-1500 m altitude. Flowering in February to March; fruiting in April.

Conservation assessment. — Endangered (EN B1ab(i,iii), B2ab(ii,iii)). This species is known from only four localities in Cambodia and Vietnam. An analysis of the Extent of Occurrence (EOO) and Area of Occupancy (AOO) gives an IUCN Conservation Assessment of Endangered.

Additional collections seen. — **Vietnam**. Hanoi: Fu-Chap, 21°4'3.936"N, 105°19'13.836"E, IV.1887, *Balansa 2440* (P[P01748443, P01748448, P01964557]); Tonkin, Lung Wau Village, Sai Wong Mo Shan (Sai Vong Mo Leng), 18.V-5.VI.1940, *Tsang 29873* (E, K, P[P00790092]).
Cambodia. Mt Cherew, 11°57'37.08"N, 104°12'27.9"E, IV.1870, *Pierre 5168* (P[P01748449, P01964569, P01964570, P01964571, P01964572, P01978529, P01978530]).

Description

Tree 6-10 m tall. Twigs slender, 2.4-3.5 mm thick, rounded in cross-section, glabrous; terminal leaf bud ovoid, 2.2-3.3 mm, apex acute, sparsely hairy. Leaves opposite, domatia absent; blade elliptic, 8-15 × 3-6.6 cm, apex acute, base cuneate and sometimes asymmetric, stiff leathery, trinerved, secondary nerves one pair, tertiary nerves scalariform; upper surface glabrous, midrib and secondary nerves raised, tertiary nerves indistinct; lower surface glabrous, midrib and secondary nerves raised, tertiary nerves indistinct; petiole half-terete, 7-18 mm long, slightly swollen, glabrous.

Inflorescence 10-15 cm long, a many flowered panicle, axillary, glabrous; bracts absent; bracteoles unknown. Flower light green, scented; perianth tube shallow, perianth lobes 2.2-4 × 1.7-1.8 mm, apex acute, very sparsely hairy; stamens 9, 1.5-2.7 mm long, hairy, anthers 4-celled; ovary ellipsoid, *c.* 1.2 mm long, glabrous, style c.1.3 mm long, stigma capitate.

Fruit ellipsoid, 12-14.5 × 8-10 mm, apex rounded, smooth, glabrous; cupule woody, 5.4-6 mm diameter, margin entire; stalk slender, *c.* 1.5 mm thick (see Fig. 5).

Notes

No evidence that this name was ever validly published could be found, so it is therefore validated here.

6. *Cinnamomum petelotii* Kosterm. ex de Kok, sp. nov. (Figs 6; 7)

Cinnamomum rigidissimum sensu Nguyễn Kim Đào, *Flora of Vietnam* 20: 250 (Nguyễn Kim Đào 2017).

Cinnamomum ovatum sensu P.H. Hô, *Cây cỏ Việtnam* 1: 349 (Hô 1999); Nguyễn Kim Đào, Lauraceae *in Checklist of Plant Species of Vietnam* 2: 79 (Nguyễn Kim Đào 2003).

Diagnosis. — This species differs from its close relative *Cinnamomum bokorense* Tagane & Yahara by having leathery ovate leaves (vs thickly leathery elliptic to lanceolate leaves in *C. bokorense*) and perianth lobes that are sparsely hairy outside (vs densely hairy outside in *C. bokorense*).

Type specimen. — **Vietnam**, Hà Tây, Massif du Tam Dao, V.1931, 21°23'35.664"N, 105°36'51.876"E, alt. *c.* 1400 m, *Pételot 5360* (holo-, P[P01964546]; iso-, L[L0035907], NY[NY00354989], P[P00790090, P01964547, P01964548]).

Vernacular name. — Vietnamese: *Re petelot* (Nguyễn Kim Đào 2017: 292).

Distribution. — Vietnam (Hà Tây, Thai Nguyen, Ha Tinh and Thua Thien-Hue) and Laos (Khamouan) (Fig. 7).

Ecology. — It grows in forests at about 575-1700 m altitude. Flowering in March to May; fruiting in July to August.

Conservation assessment. — Endangered (EN B2ab(ii,iii)). This species is only known from five collections representing five localities. An analysis of the Extent of Occurrence (EOO) gives and assessment of Not Threatened and the Area of Occupancy (AOO) gives an IUCN Conservation Assessment of Endangered. Given that it is known from so few populations and has small area of occupancy, as well as the intensive logging and landscape modification that has occurred in the region during the last 50 years, this species must be considered endangered.
This species is reported from the Vietnamese provinces of Thai Nguyen (*Đ. C. Tu s.n.*), Ha Tinh (*Thai 13)* and Thua Thien-Hue (*Thai-Thuan 600*) (see Nguyễn Kim Đào (2017: 250) but these specimens have not been seen by the author.

Additional collections seen. — **Laos**. Khammouane: Nakay district, Nakay village, behind Nam Theun Protection Office, 9.III.2006, *Svengsuksa et al. BT 222* (E).
Vietnam. Thai Nguyen, *Tu s.n.* (HNU not seen); Ha Tinh, *Thai 13* (HN not seen); Thua Thien-Hue, *Thai-Thuan 600* (HN not seen).

Description

Tree 7-20 m tall, dbh *c.* 25 cm. Twigs 2.4-3.4 mm thick, rounded in cross-section, sparsely hairy when young, glabrescent; hairs yellowish, appressed; terminal leaf bud ovoid, *c.* 2.8 mm long, apex acute, sparsely hairy. Leaves alternate to (sub)opposite, drying dark brown, smelling of etheric oils when crushed, domatia absent; leaf ovate to elliptic, 2.5-8 × 1.3-5.2 cm, apex acute, base slightly cordate to rounded, thickly leathery, trinerved, secondary nerves usually one pair, extending up to ¾ of the length of the blade, sometimes more prominent secondary side nerves present distally, tertiary nerves scalariform; upper surface glabrous, midrib and secondary nerves raised to flattened, tertiary nerves indistinct; lower surface glabrous, midrib and secondary nerves raised to flattened, tertiary nerves indistinct; petiole half-terete, 5-20 mm long, slender, glabrous.

Fig. 5. — Holotype of *Cinnamomum damhaense* Kosterm. ex de Kok, sp. nov., held at the Muséum national d'Histoire naturelle in Paris (P02132189).

Fig. 6. — Holotype of *Cinnamomum petelotii* Kosterm. ex de Kok, sp. nov., held at the Muséum national d'Histoire naturelle in Paris (P01964546).

Inflorescences 2-12 cm long, few-flowered panicles, terminal and axillary, sparsely hairy; bracts leaf-like or absent; bracteoles linear, *c.* 2.3 mm long, apex acute, sparsely hairy, caducous. Flowers with perianth tube shallow; perianth lobes elliptic, 2.6-3 × 2.2-2.6 mm, apex acute, sparsely hairy outside and inside; stamens 9, 1.8-2.3 mm long, hairy, anthers 4-celled; style and stigma unknown.

Fruits unknown. Cupule shallow, 5-6 mm in diameter (see Fig. 6).

NOTES

No evidence that this name was ever validly published could be found, and it is therefore validated here. Specimens have sometimes been placed in the southern Chinese species *Cinnamomum rigidissimum* H.T. Chang. It differs from this taxon in the placement of the inflorescences (can be terminal) and in the hairiness (pressed yellowish hairs) of the leaves and twigs (glabrous to sparsely grey-brown hairy in C. *rigidissimum*).

7. *Cinnamomum scalarinervium* Kosterm. ex de Kok, sp. nov. (Figs 7; 8)

Cinnamomum scalarinervium Kosterm. unpublished; P.H. Hô, *Câycỏ Việtnam* 1: 432 (Hô 1991 *nom inval.*); Nguyễn Kim Đào, Lauraceae *in Checklist of Plant Species of Vietnam* 2: 80 (Nguyễn Kim Đào 2003), *nom. inval.*; Nguyễn Kim Đào, *Flora of Vietnam* 20: 290 (Nguyễn Kim Đào 2017), *nom. inval.*

DIAGNOSIS. — This species differs from its close relative *Cinnamomum bokorense* Tagane & Yahara by having twigs that are sparsely hairy when young (vs glabrous in *C. bokorense*), leaves with one pair of secondary nerves that extend to the leaf tip (vs one pair extending up to ¾ of the length of the blade in *C. bokorense*), and with the lower surface very sparsely hairy (vs glabrous in *C. bokorense*), inflorescences which are densely white hairy (densely to sparsely yellowish hairy in *C. bokorense*) and a fruit cupule with minute velutinous lobes (*c.* 1 mm long) or lobes absent (vs margin always entire in *C. bokorense*).

TYPE SPECIMEN. — [**Vietnam**] Đà Nẵng: Ba Na, près de Tourane, 15°59'51.864"N, 107°59'17.088"E, alt. 700 m, 11.VII.1923, *Poilane 7077* (holo-, P[P00333195]; iso-, P[P02132175]).

VERNACULAR NAME. — Vietnamese: *Re gân hình thang* (Nguyễn Kim Đào 2017: 290).

DISTRIBUTION. — Endemic to Vietnam, Laos and Cambodia (Fig. 7).

ECOLOGY. — Grows in forests, sometimes along rivers, between 555-1500 m altitude. Flowering from February to June; fruiting from July to September.

CONSERVATION ASSESSMENT. — Vulnerable (VU B2ab(ii,iii)). This species is only known from nine localities. An analysis of the Extent of Occurrence (EOO) gives an assessment of Least Concern and an Area of Occupancy (AOO) gives an IUCN Conservation Assessment of Vulnerable. Given that it is known from few populations and has small area of occupancy, as well as the intensive logging and landscape modification that has occurred in the region during the last 50 years, this species must be considered Vulnerable.

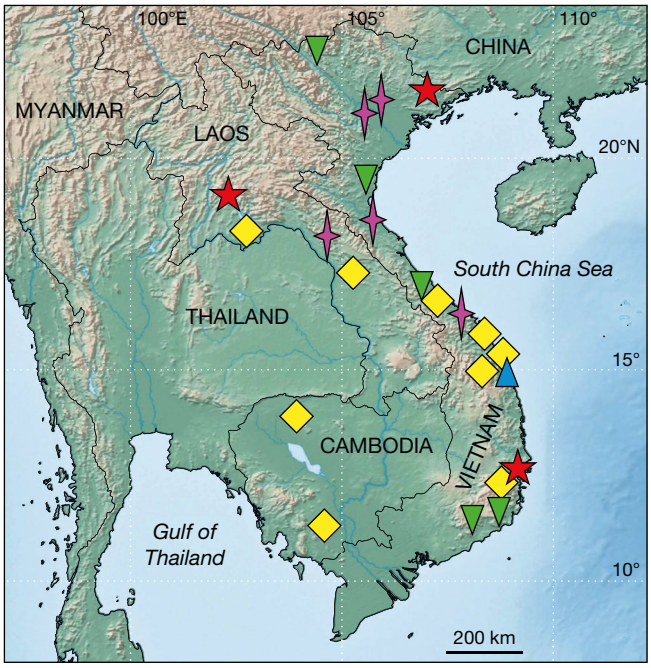

FIG. 7. — Distribution of *Cinnamomum petelotii* Kosterm. ex de Kok, sp. nov. (✦), *Cinnamomum scalarinervium* Kosterm. ex de Kok, sp. nov. (◇), *Litsea banaensis* de Kok, sp. nov. (▲), *Litsea honbaensis* de Kok, sp. nov. (▼) and *Litsea nhatrangensis* de Kok, sp. nov. (★).

ADDITIONAL COLLECTIONS SEEN. — **Vietnam**. Quang Tri, Poste 6, 15°40'12"N, 107°39'0"E, 24.III.1939, *Poilane 29571* (P[P01752651, P01964443]); Poste 6, 15°48'14.472"N, 107°50'4.524"E, 18.III.1939, *Poilane 29403* (P[P01752649, P01964442]); Đà Nẵng, Ba-Na, 15°59'51.864"N, 107°59'17.088"E, 4.VI.1920, *Poilane 1505* (P[P01752648, P01752655]); Dalat, 11°56'25.512"N, 108°27'29.916"E, 3.XII.1924, *Evrard 2035* (P[P01752652, P01964391]). — Thừa-Thiên, Haut cours du Bo-Giang, 16°31'55.668"N, 107°30'48.888"E, *Eberhardt 2718* (P[P01752644, P01752645]). — Quang Nam: près Poste 6, 15°40'12"N, 107°39'0"E, 24.III.1939, *Poilane 29571* (P[P01752651, P01964443]).
Laos. Vientiane: Pu tat, 18°7'19.596"N, 102°37'37.596"E, 22.IV.1932, *Kerr 21198* (BM, K, P[P01752653]). — Khammouane: Nakai District, Ban Talang, 28.II.2007, *Vannachak BT 873* (E, K, P[P01062904, P01062905]).
Cambodia. Kampot: Kiricom, 11°19'18.552"N, 104°3'13.248"E, 8.IX.1948, *S.R.R.F. 444* (P[P01752656]); Pusat: Vers Anlong Krauch, 12°19'0.516"N, 103°15'5.04"E, 29.XII.1968, *Martin 1395bis* (P[P01752654]).

DESCRIPTION

Tree 1.8-12 m tall, dbh 16-20 cm, bark green. Twigs slender 1.3-4 mm thick, rounded in cross-section, sparsely hairy when young, glabrescent; hairs whitish, appressed; terminal leaf bud ovoid, 1.5-1.7 mm long, apex acute, velutinous. Leaves alternate to (sub)opposite, drying light green, domatia absent; leaf blade linear to lanceolate, 6-15 × 1.6-4.7 cm, apex acute, base cuneate, leathery, trinerved, secondary nerves one pair, extending to the tip of the blade, tertiary nerves scalariform; upper surface glabrous, midrib and secondary nerves raised, tertiary nerves indistinct; lower surface glaucous, very sparsely hairy, midrib and secondary nerves raised, tertiary nerves indistinct; hairs white, indistinct; petiole half-terete, 4.5-8 mm long, slender, glabrous.

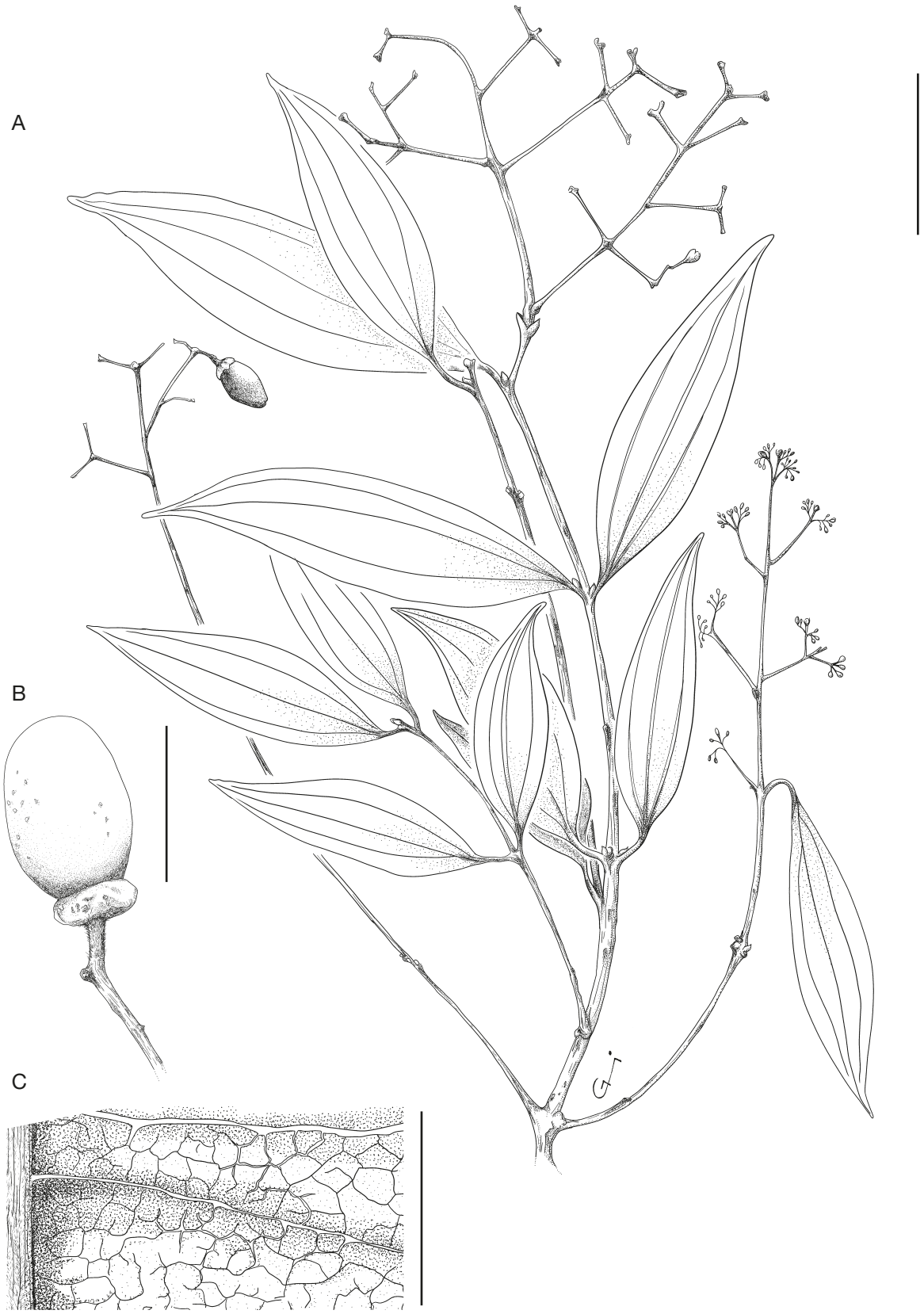

Fig. 8. — Plate of *Cinnamomum scalarinervium* Kosterm. ex de Kok, sp. nov.: **A**, twig with leaves, inflorescence and infructescence; **B**, fruit with cupule; **C**, detail of leaf under surface. All from *Poilane 7077* (P00333195). Drawing by Giulia Iaconelli. Scale bars: A, 5 cm; B, 1 cm; C, 0.5 cm.

Inflorescence 8-14 cm long, a few-flowered panicle, terminal, densely hairy; hairs whitish, appressed; bracteoles linear, 1-1.9 mm long, apex acute, velutinous, caducous. Flowers yellowish; perianth tube shallow; perianth lobes elliptic, 15-1.7 × 1.3-1.4 mm, apex acute, densely hairy outside; stamens 9, *c.* 1.4 mm long, hairy, anthers 4-celled; ovary 1.6 mm diameter, glabrous.

Fruits ellipsoid, 10-18 × 8.5-11 mm, apex rounded, smooth, glabrous; cupule lobed, 5.7-9.8 mm diameter; lobes linear, 0-1 mm long, velutinous; stalk hardly swollen, up to 1.3 mm thick (see Fig. 8).

Notes

No evidence that this name was ever validly published could be found and it is therefore validated here.

Genus *Litsea* Lam.

8. ***Litsea banaensis*** de Kok, sp. nov. (Fig. 7)

Diagnosis. — This species differs from its close relative *Litsea balansae* Lecomte by having a lanceolate terminal leaf bud about 4.6 mm long (vs terminal leaf bud linear and 2.7-3 mm long in *L. balansae*); leaves chartaceous with scalariform-reticulate tertiary nerves which are indistinct above and distinct below (leaves membranous with tertiary nerves reticulate and distinct on both surfaces in *L. balansae*) and petioles 10-14 mm long and fruits 11-14 × 6.5-8 mm (vs petioles 3-6 mm long and fruits 4-8 × 3-4 mm in *L. balansae*).

Type specimen. — **Vietnam**, Ba-Na, près de Tourane, 16°1'6.096"N, 108°0'36.972"E, 4.III.1939, *Poilane 29230* (holo-, P[P02035872]).

Distribution. — Vietnam (Fig. 7).

Ecology. — Growing in forest over granite, between 800-900 m altitude. Flowering from January to May; fruiting from February.

Conservation assessment. — Critically Endangered (CR B1ab(i,iii), B2ab(ii,iii)). This species is only known from two collections, both from the same locality in Ba-Na. The Extent of Occurrence (EOO) and Area of Occupancy (AOO) suggest an IUCN Conservation Assessment of Critically Endangered.

Additional collections seen. — **Vietnam**. Đà Nẵng: Ba-Na, près de Tourane, 11°22'39.648"N, 108°50'36.996"E, 27.II.1939, *Poilane 29117* (P[P02035874]).

Description

Tree 5-6 m tall, dbh *c.* 10 cm. Twigs slender, 2.6-3 mm thick, rounded in cross-section, densely hairy when young, glabrescent; hairs yellowish, appressed; terminal leaf bud lanceolate, *c.* 4.6 mm long, apex acute, velutinous. Leaves alternate; blade elliptic to lanceolate, 8.5-19 × 3.8-6 cm, apex acuminate, chartaceous, base cuneate, secondary nerves 9-12 pairs, curving near margins, tertiary nerves scalariform-reticulate; upper surface glabrous, midrib and secondary nerves sunken, tertiary nerves indistinct; lower surface sparsely hairy, midrib and secondary nerves raised, tertiary nerves distinct; hairs appressed to erect, yellowish; petiole half-terete, 10-14 mm long, sparsely hairy, slightly swollen.

Inflorescences axillary, 11-16 mm long, a series of clusters of umbels, sparsely hairy. Flowers unknown.

Fruits 1-2 per infructescence, ellipsoid, 11-14 × 6.5-8 mm, apex acute, smooth, glabrous; cupule shallow, 3.7-4.3 × 1.4-1.6 mm, margin entire, patent, smooth, sparsely hairy; stalk swollen up to 1.9 mm thick, slightly hairy.

Notes

Although flowers are unknown for this new species, which would normally be problematic for its generic placement in this family, it fits morphologically (inflorescences a cluster of umbels, fruits with a shallow cupule) very well in *Litsea,* and I have decided to place it here.

9. ***Litsea honbaensis*** de Kok, sp. nov. (Figs 7; 9)

Diagnosis. — This species differs from its close relative *Litsea helferi* Hook.*f.* by having a glabrous petiole which is slightly swollen (while *L helferi* has a sparsely hairy slender petiole); fruits which are 14-16 × 7-8 mm on a cupule about 5.4 mm diameter (while *L. helferi* has fruits 28-32 × 18-24 mm and a cupule 6.5-6.9 mm diameter).

Type specimen. — **Vietnam**, Khanh Hoa: 12 km to Hon Ba, 12°6'56.016"N, 108°58'40.008"E, 24.VI.2004, *Soejarto 13305* (holo-, P[P01052426]).

Distribution. — Vietnam (Fig. 7).

Ecology. — Growing in forests over granite between 800-900 m altitude. Flowering from January to May; fruiting in February.

Conservation assessment. — Endangered (EN B1ab(i,iii), B2ab(ii,iii)). This species is only known from eight collections representing five localities in Vietnam (plus one locality that could not be found). An analysis of the Extent of Occurrence (EOO) and Area of Occupancy (AOO) gives an IUCN Conservation Assessment of Endangered.

Additional collections seen. — **Vietnam**. Nghe-An (Vinh): Huyên de Nghia-Dam, 11°51'3.6"N, 108°36'25.2"E, 18.V.1941, *Poilane 30571* (P[P06856488]). — Lào Cai: Chapa et Cho-Bo, Chapa, 22°20'3.984"N, 103°50'51"E, VII.1930, *Pételot 5365* (P[P02003173, P02003180]); Chapa et Cho-Bo, 800 m, 6.IX.1926, 20°49'0.012"N, 105°12'E, *Poilane 13165* (P[P01976054, P01155417]). — Thua Thien-Hue: Nui Back Ma station, près de Huế, 16°10'0.984"N, 107°49'58.008"E, 24.IV.1939, *Poilane 29982* (P01976319). — Lâm Đồng: Blao, 11°28'40.8"N, 107°44'16.8"E, 28.VI.1933, *Poilane 22776* (P02011236). — Tuyên Quang, Tonkin, Nguyen Luang, 21°46'36.228"N, 105°13'40.872"E, VI.1925, *Pételot 1931* (P02011174).

Description

Tree 8-10 m tall; dbh *c.* 20 cm. Twigs slender, 1-1.6 mm thick, rounded in cross-section, densely hairy when young, glabrescent; hairs yellowish, appressed; terminal leaf bud lanceolate, *c.* 2.5 mm long, apex acute, velutinous. Leaves alternate; blade elliptic to lanceolate, 3.3-6.5 × 1-3 cm, apex acuminate, base cuneate, membranous, secondary nerves 4-5 pairs, curving near margin, tertiary nerves reticulate; upper surface glabrous, midrib and secondary nerves sunken, tertiary nerves indistinct; lower surface glaucous, glabrous, midrib and secondary nerves raised, tertiary nerves distinct; petiole half-terete, 8-14 mm long, glabrous, slightly swollen.

Fig. 9. — Plate of *Litsea honbaensis* de Kok, sp. nov.: **A**, twig with leaves, inflorescence and infructescence; **B**, infructescence with fruit; **C**, detail of leaf under surface. All from *Poilane 13165* (P01155417). Drawing by Giulia Iaconelli. Scale bars: A, 5 cm; B, 1.5 cm; C, 0.5 cm.

Inflorescences in axils of leaves, 7.5-10 mm long, in clusters of umbels, densely hairy. Flowers white; male flowers: perianth lobes linear, 1-1.4 × 0.5-0.6 mm, apex rounded, inside glabrous, outside velutinous; stamens 1-1.5 mm long; female flowers: perianth lobes linear, 1-1.5 × 0.5-0.6 mm, apex rounded, inside glabrous, outside velutinous; ovary *c.* 0.9 mm diameter, glabrous.

Fruits 1-3 per infructescence, ellipsoid, 14-16 × 7-8 mm, apex acute, smooth, glabrous; cupule shallow, *c.* 5.4 × 2.3 mm, margin entire, patent, smooth, sparsely hairy; stalk swollen up to 1.9 mm thick, slightly hairy (see Fig. 9).

10. ***Litsea nhatrangensis*** de Kok, sp. nov. (Figs 7; 10)

Litsea robusta sensu Nguyễn Kim Đào, Lauraceae *in Checklist of Plant Species of Vietnam* 2: 98 (2003); Nguyễn Kim Đào, *Flora of Vietnam* 20: 402 (2017).

Diagnosis. — This species differs from its close relative *Litsea grandifolia* Lecomte by having leaves with 11-15 pairs of secondary nerves, a midrib and secondary nerves which are raised above and tertiary nerves that are distinct on the lower surface (while *L. grandifolia* has leaves with 6-8 pairs of secondary nerves, a midrib and secondary nerves which are sunken above and tertiary nerves that are indistinct on the lower surface); petioles which are 23-55 mm long (while *L. grandifolia* has petioles 9-11 mm long); fruits that are globose, 20-25 × 20-22 mm with a cupule 18-20 × 9-10 mm and a swollen stalk (5-6 mm thick) (while *L. grandifolia* has fruits that are ellipsoid, 8.8-15 × 5.6-9 mm with a cupule 7-8.3 × 7.3-12 mm and a slender stalk (*c.* 1.3 mm thick).

Type specimen. — **Vietnam**, Nha Trang, 12°40'59.988"N, 108°58'0.012"E, alt. 450 m, 4.IX.1922, *Poilane 5019* (holo-, P[P04456803]; iso-, P[P04450136, P04456748].

Vernacular name. — Vietnamese: *Toc poc* (*Poilane 5019*).

Distribution. — Laos and Vietnam (see Fig. 7).

Ecology. — Growing in forest over limestone, between 300-450 m altitude. Flowering in April; fruiting from February to December.

Conservation assessment. — Endangered (EN B1ab(i,iii), B2ab(ii,iii)). This species is only known from four collections representing four localities in Vietnam and Laos. An analysis of the Extent of Occurrence (EOO) and Area of Occupancy (AOO) gives an IUCN Conservation Assessment of Endangered.

Additional collections seen. — **Vietnam**. Lang Son: entre Dong Mô et Van Linh, 21°48'43.992"N, 106°42'42.984"E, 28.IV.1938, *Pételot 6373* (P01976196); Ninh Binh: Cuc Phuong National Park, 12.III.2007, *Nguyen et al. HNK-1468* (K).
Laos. Louang Prabang, Pac Bae, 19°45'2.34"N, 102°16'56.388"E, alt. *c.* 300-400 m, 23.III.1932, *Poilane 20485* (P02011178, P02035910).

Description

Tree 5-18 m tall, dbh 15-43 cm. Twigs stout, 6.3-7.4 mm thick, rounded in cross-section, glabrous; terminal leaf bud unknown. Leaves alternate; blade lanceolate, 18-45 × 10-16 cm, apex acute, sometimes emarginate, base cuneate, blade stiff-leathery, penninerved, secondary nerves 11-15 pairs, curving and looping near margin, tertiary nerves scalariform-reticulate; upper surface glabrous, midrib and secondary nerves raised, tertiary nerves distinct; lower surface glabrous, midrib and secondary nerves raised, tertiary nerves distinct; petiole half-terete, 23-55 mm long, swollen, glabrous.

Inflorescences cauliflorous or in leaf axils, 15-30 mm long, in clusters of umbels, densely hairy; bracts 4, 5-6.3 × 4.5-5 mm, apex acute, velutinous. Flowers: male flowers: perianth lobes 3.4-4.6 × 0.9-1.7 mm, apex rounded to acute, sparsely hairy outside, glabrous inside; stamens 3.9-4.8 mm long, sparsely hairy; female flowers: perianth lobes lanceolate, 2-2.5 × 0.6-0.8 mm, apex acute, glabrous.

Fruits globose, 20-25 × 20-22 mm, apex rounded, smooth, glabrous; cupule shallow, 18-20 × 9-10 mm, margin entire, warty; stalk slender, 6-8.5 × 5-6 mm (see Fig. 10).

11. ***Litsea rubrobrunnea*** de Kok, sp. nov. (Figs 11; 12)

Diagnosis. — This species differs from its close relative *Litsea monopetala* (Roxb.) Pers. by having leaves with an acute apex and 10-13 pairs of secondary nerves (while *L. monopetala* has leaves with an obtuse acute to acuminate apex and 6-11 pairs of secondary nerves); petioles which are swollen and 8-11 mm long (while *L. monopetala* has petioles which are slender and 10-25 mm long). —

Type specimen. — [**Vietnam**] près Tourane, 16°4'18.372"N, 108°9'1.368"E, 10.VIII.1923, *Poilane 7829* (holo-, P[P01976151]).

Distribution. — Vietnam (see Fig. 12).

Ecology. — Growing in lowland and mountain forest, sometimes over limestone, between 500-1800 m altitude. Flowering between December to April; fruiting from August to March.

Conservation assessment. — Vulnerable (VU B2ab(ii,iii)). This species is only known from six localities. An analysis of the Extent of Occurrence (EOO) gives an assessment of Least Concern and the Area of Occupancy (AOO) suggests an IUCN Conservation Assessment of Vulnerable. Given that it is known from only six populations and has small area of occupancy as well as the intensive logging and landscape modification that has occurred in the region during the last 50 years, this species must be considered Vulnerable.

Additional collections seen. — **Vietnam**. Thua Thien-Hue: Nui Back Ma, près de Huế, 16°10'0.984"N, 107°49'58.008"E, 20.IV.1939, *Poilane 29853* (P02132127); Quang Tri: Massif de Dong Che, 16°37'58.8"N, 106°55'58.8"E, 22.VIII.1924, *Poilane 11271* (P02132139); Quang Nam: près de village Moi de Go-oi, 24.II.1941, *Poilane 31548* (P); Đà Nẵng: Ba-Na, près Tourane, 11°22'39.648"N, 108°50'36.996"E, 27.II.1939, *Poilane 29117* (P02035874); Lào Cai: village de Tien Chua, nord de Lai Chau, 22°24'51.732"N, 103°26'57.264"E, 12.IV.1936, *Poilane 25728* (P01976047).

Description

Tree 5-10 m tall, dbh 10-33 cm. Twigs slender 2.6-4.2 mm thick, rounded in cross-section, sparsely hairy when young, glabrescent; hairs yellowish, appressed; terminal leaf bud ovoid, *c.* 2 mm long, apex acute, velutinous. Leaves alternate, drying brown reddish; blade elliptic to lanceolate, 12-16 × 4.5-6 cm, apex acute, base cuneate, blade leathery, penninerved, secondary nerves 10-13 pairs, curved near margin and brochidodromous, tertiary nerves scalariform-

Fig. 10. — Plate of *Litsea nhatrangensis* de Kok, sp. nov.: **A**, twig with leaves; **B**, infructescence with fruit; **C**, detail of leaf under surface. All from *Poilane 5019* (P04456803). Drawing by Giulia Iaconelli. Scale bars: A, 5 cm; B, 2 cm; C, 1 cm.

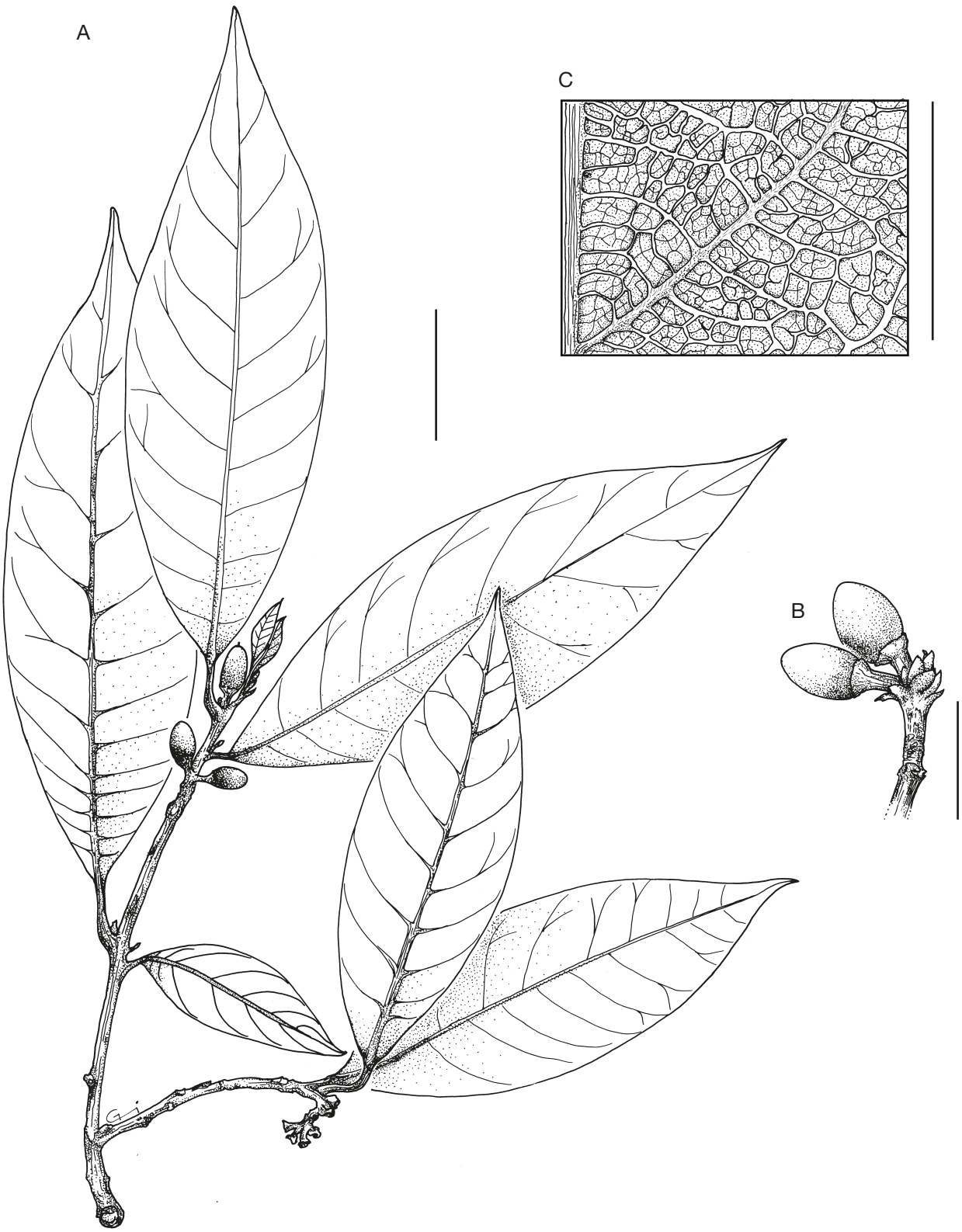

Fig. 11. — Plate of *Listea rubrobrunnea* de Kok, sp. nov.: **A**, twig with leaves and infructescence; **B**, infructescence with fruit; **C**, detail of leaf under surface. All from *Poilane 29117* (P02035874). Drawing by Giulia Iaconelli. Scale bars: A, 4 cm; B, 2 cm; C, 1.5 cm.

reticulate; upper surface glabrous, sometimes densely hairy on midrib, midrib and secondary nerves sunken, tertiary nerves distinct; lower surface sparsely hairy, often more densely hairy on major veins, midrib and secondary nerves raised, tertiary nerves distinct; petiole half-terete, 8-11 mm long, swollen, densely hairy.

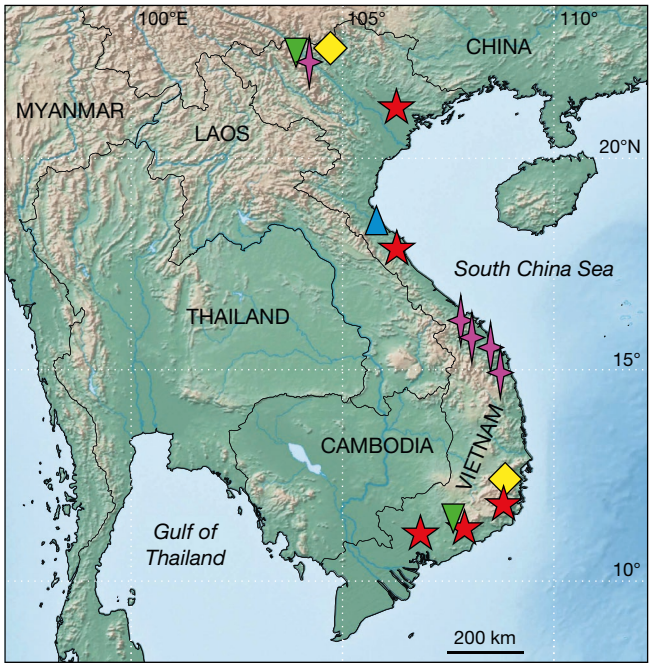

Fig. 12. — Distribution of *Litsea rubrobrunnea* de Kok, sp. nov. (✦), *Litsea salmonea* A.Chev. ex de Kok, sp. nov. (◇), *Machilus coriacea* A.Chev. ex de Kok, sp. nov. (★), *Neocinnamomum huongsonensis* Kim Dao, sp. nov. (▲) and *Phoebe petelotii* Kosterm. ex de Kok, sp. nov. (▼).

Inflorescences in leaf axils, 4-8 mm long, in clusters of umbels, glabrous to sparsely hairy; hairs yellowish, appressed. Flowers unknown.

Fruit ellipsoid, 14-18 × 6.5-9.7 mm, apex rounded, smooth, glabrous; cupule woody, 4.5-5 × 2.9-4 mm, margin entire, glabrous, surface warty; stalk not swollen, *c.* 2.3 mm thick (see Fig. 11).

Notes

Flowers are unknown for this new species, which is problematic for its generic placement. However, its other characters fit morphologically (like the inflorescence shape and cupule) very well in *Litsea,* and I have decided to place it here.

12. ***Litsea salmonea*** A.Chev. ex de Kok, sp. nov. (Figs 12; 13)

Litsea salmonea A.Chev, unpublished; P.H.Hô, *Illustrated Flora of Vietnam* 452 (Hô 1991), *nom. inval.*); Nguyễn Kim Đào, Lauraceae *in Checklist of Plants Species of Vietnam* 2: 87 (Nguyễn Kim Đào 2003), *nom. inval.*).

Diagnosis. — This species differs from its close relative *Litsea balansae* Lecomte by having terminal leaf buds which are ovoid and sparsely hairy (terminal leaf buds are linear and velutinous in *L. balansae*); leaves thinly leathery with scalariform tertiary nerves and indistinct on both surfaces, and a petiole 8-10 mm long (leaves membranous with reticulate tertiary nerves and distinct on both surfaces; petiole 3-6 mm long in *L. balansae*).

Type specimen. — **Vietnam**. Nha Trang, Massif du Hôn Bâ, 1.IX.1918, *Chevalier 38880* (holo-, P[P02003527]; iso-, K[K000815578], P[P02003528, P02003529, P02003530, P02259646, P02259647]).

Vernacular name. — Vietnamese: *Bởi lời thịt cá hồi* (Nguyễn Kim Đào 2017: 398).

Distribution. — Vietnam (see Fig. 12).

Ecology. — Growing in forest between 1000-1500 m altitude; flowering in September; fruiting in August.

Conservation. — Endangered (EN B1ab(i,iii), B2ab(ii,iii)). This species is only known from two collections, each representing a single locality in Vietnam. An analysis of the Extent of Occurrence (EOO) and Area of Occupancy (AOO) gives an IUCN Conservation Assessment of Endangered.

Additional collections seen. — **Vietnam**, Tonkin, Chapa, 22°20'3.984"N, 103°50'51"E, VIII.1932, *Pételot 5374* (P01976415, P01976458).

Description

Tree. Twigs slender, 1.2-2 mm thick, angular in cross-section, sparsely hairy when young; hairs appressed, yellowish; terminal leaf bud ovoid, 2.4-5.3 mm long, apex acute, sparsely hairy. Leaves alternate, lower surface coloured salmon red; blade elliptic to lanceolate, 5-15 × 2.3-5.5 cm, apex long acuminate, base cuneate, blade thinly leathery, penninerved, secondary nerves 5-6 pairs, curving near margin, tertiary nerves scalariform; upper surface sparsely hairy at base and on major nerves, midrib and secondary nerves raised, tertiary nerves indistinct; lower surface sparsely hairy, more densely hairy on major nerves, midrib and secondary nerves raised, tertiary nerves indistinct; petiole channelled, 8-10 mm long, slender, sparsely hairy.

Inflorescence axillary, 10-13 mm long, a raceme bearing pedunculate single umbels along an axil, sparsely hairy, bracts leaf-like; bracteoles caducous. Flowers unknown.

Fruits globose, 7-7.8 × 8.7-9.5 mm, apex rounded, smooth, glabrous; cupule 4.8-5 mm diameter, margin entire, sparsely hairy; stalk tapering upwards, 2 mm thick (see Fig. 13).

Notes

No evidence that this name was ever validly published could be found, and it is therefore validated here. Although, the flowers are unknown for this species, which is problematic for its generic placement, its other morphological characters (like the inflorescence shape and cupule) fit well in *Litsea* and traditionally it has been placed in this genus.

Genus *Machilus* Nees

13. ***Machilus coriacea*** A.Chev. ex de Kok, sp. nov. (Figs 12; 14)

Machilus coriacea A.Chev. unpublished; P.H.Hô, *Cây cỏ Việt nam* 1: 489 (Hô 1991), *nom. inval.*; Nguyễn Kim Đào, Lauraceae *in Checklist of Plant Species of Vietnam* 2: 101 (Nguyễn Kim Đào 2003), *nom. inval.*; Nguyễn Kim Đào, *Flora of Vietnam* 20: 95 (Nguyễn Kim Đào 2017), *nom. inval.*

Diagnosis. — This species differs from its close relative *Machilus grandibracteata* S.K.Lee & F.N.Wei, which has twigs that are glabrous

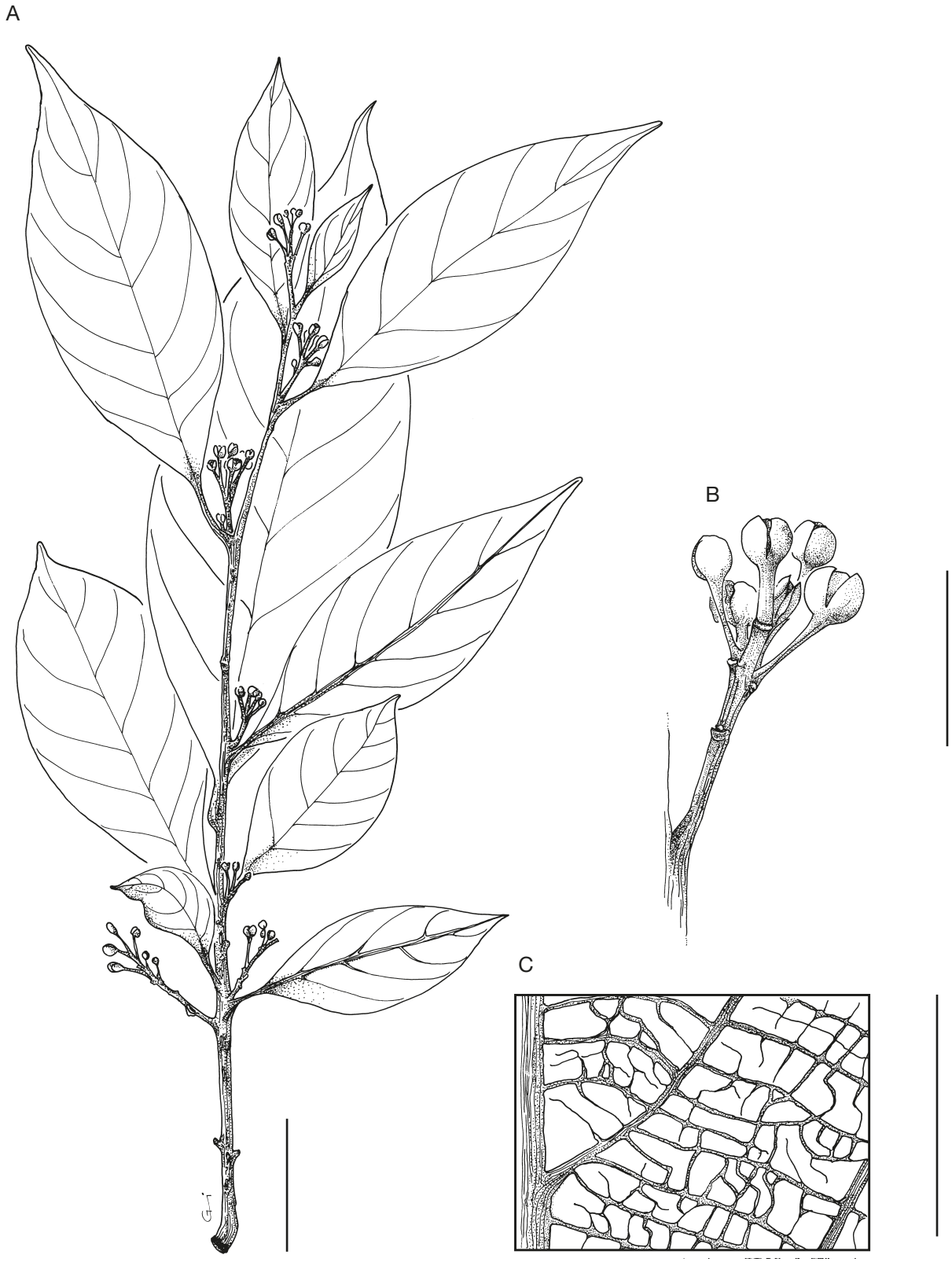

Fig. 13. — Plate of *Litsea salmonea* A.Chev. ex de Kok, sp. nov. : **A**, twig with leaves and infructescence; **B**, inflorescences with umbels; **C**, detail of leaf under surface. All from *Chevalier 38880* (P02259646). Drawing by Giulia Iaconelli. Scale bars: A, 4 cm; B, 1 cm; C, 1.5 cm.

and leaves with 9-11 pairs of secondary nerves (while *M. coriacea* A.Chev. ex de Kok, sp. nov. has sparsely hairy twigs and leaves with 7-9 pairs of secondary nerves); inflorescence which are densely hairy and perianth lobes which are sparsely hairy inside and outside (while *M. coriacea* A.Chev. ex de Kok, sp. nov. has inflorescence which are sparsely hairy and perianth lobes densely hairy inside and outside).

Type specimen. — [**Vietnam**] Bien Hoa: Dinh Quan, 11°9'24.66"N, 107°15'8.928"E, 4.XII.1932, *Poilane 21630* (holo-, P[P02004544]; iso-, E[no barcode]).

Vernacular name. — Vietnamese: *Kháo dai* (Nguyễn Kim Đào 2017: 95).

Distribution. — Vietnam (see Fig. 12).

Ecology. — Growing in forest, sometimes over limestone, between 1000-1500 m altitude. Flowering from Nov. to January; fruiting in Sept.

Conservation. — Endangered B2ab(i,ii,iii,iv) This species is only known from five collections from Vietnam. An analysis of the Extent of Occurrence (EOO) and Area of Occupancy (AOO) gives an IUCN Conservation Assessment of Endangered.

Additional collections seen. — **Vietnam**. Nha Trang: Massif du Hon-Ba, 12°22'59.988"N, 108°52'59.988"E, alt. *c.* 1000-1500 m, 1.IX.1918, *Chevalier 38881* (P00476642, P02004595, P02004596, P02004597); Lang Son: Bang Mac, 17.I.1941, *Pételot 6729* (P); Vinh: Tam Dao, 21°20'7.008"N, 105°35'21.012"E, IV.1931, *Pételot 4680* (P02008991); Saigon: Hoc-Môn, 10°53'16.008"N, 106°35'39.012"E, XI.1942, *Anonymous 9197* (P02003810).

Description

Trees 10-20 m tall, dbh 20-25 cm. Twigs slender, 1.6-3 mm thick, rounded in cross-section, sparsely hairy; hairs appressed, yellowish; terminal leaf bud ovoid 5-7 mm long, apex acute, velutinous, imbricate. Leaves alternate; blade elliptic to oblanceolate, 6-16 × 2.5-7.6 cm, apex acute, base cuneate, leathery, penninerved, secondary nerves 7-9 pairs, curved towards margin, tertiary nerves scalariform-reticular; upper surface glabrous, midrib and secondary nerves sunken, tertiary nerves indistinct; lower surface sparsely hairy, midrib and secondary nerves raised, tertiary nerves distinct; hairs yellowish, erect; petiole channelled, 18-20 mm long, sparsely hairy, slender.

Inflorescence 10-15 cm long, terminal, sparsely hairy; bracts leaf-like; bracteoles linear, *c.* 2 mm long. Flowers white; perianth lobes 2.4-4.5 × 1.1-1.4 mm, apex acute, densely hairy inside and outside; stamens 9, 3.4-4 mm long, glabrous; ovary *c.* 0.7 mm diam.

Fruit globular, 18-20 × 16-18 mm, apex rounded, glabrous; perianth lobes 7.5-8 × 2.9-3.6 mm, apex acute, densely hairy, erect, patent to reflexed, membranous (see Fig. 14).

14. ***Neocinnamomum huongsonensis*** Kim Dao, sp. nov. (Fig. 12)

Flora of Vietnam 20: 299 (Nguyễn Kim Dao 2017), *nom. inval.*, holotype not correctly cited.

Diagnosis. — This species differs from its close relative *Neocinnamomum lecomtei* H.Liou by having glabrous leaves and twigs (vs densely hairy in *N. lecomtei*) and fruits that are black when mature (rather than red or orange when mature in *N. lecomtei*).

Type specimen. — [**Vietnam**] Ha Tinh, Huong Son, Rao An, *Mack et al. 455* (holo-, HN not seen; iso-, P not seen).

Distribution. — Vietnam: Ha Tinh (see Fig. 12).

Ecology. — Growing in evergreen dry forests. Flowering and fruiting reported from July to September (Nguyễn Kim Dao 2017: 301).

Conservation. — Critically Endangered (CR B1ab(i,iii), B2ab(ii,iii)). This species is only known from one collection from Ha Tinh. An analysis of the Extent of Occurrence (EOO) and Area of Occupancy (AOO) gives an IUCN Conservation Assessment of Critically Endangered.

Description

Tree 5-7 m tall. Twigs slender, terete, glabrous, light brown. Leaves subopposite; blade oblong-lanceolate, 5-13 × 2-4.5 cm, apex acute to acuminate, base obtuse, glabrous on both surfaces, triplinerved, secondary nerves 2-3 pairs, basal secondary nerves extending up to ¾ the length of the blade, midrib sunken above and raised below; petiole slender, 1-1.5 cm long, glabrous.

Inflorescences axillary, 1-10 mm long, sparsely hairy; bracts leaf-like; bracteoles caducous. Flowers greenish; perianth lobes broadly ovate, 1.5-2 × 1-1.2 mm, apex acute, sparsely hairy outside; stamens 9, *c.* 1 mm long, hairy at base, anthers 4-celled; ovary ovoid, 0.5-0.7 mm long, glabrous; style 0.3-0.5 mm long, stigma conspicuously lobed.

Fruit globose, *c.* 2 × 2.5 cm, glabrous, inconspicuously angulate in cross-section, black when mature; perianth lobes persistent, small; stalk slender.

Notes

Unfortunately, Nguyễn Kim Dao (2017) did not validly publish this name because she cited its type material as deposited in two different herbaria without mentioning which specimen is the holotype (see article 40.7 in Turland *et al.* 2018), the species is validated here. The description here is based on Nguyễn Kim Dao (2017: 299, fig. 152).

Genus *Phoebe* Nees

15. ***Phoebe petelotii*** Kosterm. ex de Kok, sp. nov. (Figs 12; 15)

Phoebe petelotii Kosterm., unpublished; P.H.Hô, *Cây cỏ Việtnam* 1: 486 (Hô 1991), *nom. inval.*; Nguyễn Kim Đào, Lauraceae *in Checklist of Plants Species of Vietnam* 2: 110 (Nguyễn Kim Đào 2003), *nom. inval.*; Nguyễn Kim Đào, *Flora of Vietnam* 20: 114 (Nguyễn Kim Đào 2017), *nom. inval.*

Diagnosis. — This species differs from its close relative *Phoebe macrocarpa* C.Y.Wu by having 4-5 pairs of secondary nerves and small fruits (14-18 × 10-12 mm), while *P. macrocarpa* has 23-34 pairs of secondary nerves and large fruits (35-42 × 19-22 mm).

Type specimen. — [**Vietnam**, Lào Cai], Bosquet près de l'Église, Chapa, 22°18'56.016"N, 103°51'24.012"E, alt. 2500 m, IV.1935, *Pételot 5383bis* (holo-, P[P00752532]; iso-, P[P00752533]).

Vernacular name. — Vietnamese: *Re trắng petelot* (Nguyễn Kim Đào 2017: 114).

Distribution. — Vietnam (see Fig. 12).

Ecology. — Growing in forest over limestone at 800-2500 m altitude. Flowering in August to February; fruiting in August.

Fig. 14. — Holotype of *Machilus coriacea* A.Chev. ex de Kok, sp. nov., held at the Muséum national d'Histoire naturelle in Paris (P02004544).

Conservation. — Endangered (EN B1ab(i,iii), B2ab(ii,iii)). This species is only known from three collections representing two localities, both in Vietnam. An analysis of the Extent of Occurrence (EOO) and Area of Occupancy (AOO) gives an IUCN Conservation Assessment of Endangered.

Additional collections seen. — **Vietnam**. Lâm Dông: Blao, 11°31'43.392"N, 107°48'7.632"E, 16.II.1933, *Poilane 21978* (BO, K, P[P02009080, P02009081]); Lào Cai, Massif calcaire près de l'Église, Chapa, 22°18'56.016"N, 103°51'24.012"E, IV.1935, *Pételot 5383* (P[P00752534, P00752535]).

Description

Trees 8-9 m tall, dbh *c.* 10 cm; twigs robust, 4-5 mm thick, velutinous when young, scars of terminal leaf buds concentrated at base of twigs; terminal leaf bud ovoid, 3.4-3.7 mm long, apex acute, velutinous; leaves alternate; blade elliptic, 6.5-10.5 × 3-5.7 mm, apex acute, base cuneate, blade leathery, penninerved, secondary nerves 4-5 pairs, brochidodromous, tertiary nerves scalariform-reticulate; upper surface glabrous, midrib sunken, secondary nerves and tertiary nerves indistinct; lower surface sparsely hairy, midrib and secondary nerves raised, tertiary nerves distinct; petiole channelled, slender, 15-25 mm long.

Inflorescence a panicle 40-120 mm long, velutinous when young. Flowers: inner perianth lobes larger than outer ones, 3.3-4.5 × 2.2-2.3 mm, apex acute, velutinous outside and inside; stamens 9, 1.8-2 mm long, sparsely hairy; ovary globose, *c.* 0.6 mm diameter, glabrous.

Fruits ellipsoid to globose, 14-18 × 10-12 mm, apex rounded to acute, smooth, glabrous; cupule lobes 4.2-4.7 × 2.3-2.4 mm, apex acute (often truncated later), erect, sparsely hairy, glabrescent (see Fig. 15).

Notes

This species name was first proposed by Kostermans on herbarium sheets in several herbaria, but no evidence that this name was ever validly published could be found and is therefore validated here.

NEW COMBINATIONS

Family Lauraceae Juss.
Genus *Actinodaphne* Nees

1. *Actinodaphne cambodiana* (Lecomte) de Kok, comb. nov.

Neolitsea cambodiana Lecomte, *Notulae Systematicae* 2: 335 (Lecomte 1913).

Type specimen. — **Cambodia**. Kuang Krepeu, 13°15'7.992"N, 103°50'40.992"E, alt. 600 m, V.1870, *Pierre 5154* (lecto-, P[P00745398] designated here; isolecto-, K[K000951002, K000350884], P[P00745397, P00745399, P00745400]).

Remarks

Given this taxon leaf orientation (3-5 leaves in pseudo-whorls), inflorescences (shape and with bracts at its base) and flowers (unisexual, perianth lobes and stamens six) it is better placed in the genus *Actinodaphne*.

2. *Actinodaphne rehderiana* (C.K.Allen) de Kok, comb. nov.

Illustrated Flora of Vietnam 439 (Hô 1991); *Flora of Vietnam* 20: 410 (Nguyễn Kim Đào 2017). — *Litsea rehderiana* C.K.Allen, *Annals of the Missouri Botanical Garden* 25: 381 (Allen 1938).

Type specimen. — [**Vietnam, Đại Lào**] Haut Donai, Massif de Braïan, 11°27'59.004"N, 107°43'59.988"E, alt. 1700-1800 m, 16.I.1935, *Poilane 23907* (lecto-, P[P00745313] designated here; isolecto-, L[L0820727, L0035491], P[P00745314, P00706265]).

Remarks

This name was proposed by Kostermans on several herbarium sheets and accepted in various publications, without ever validity making the combination.

3. *Actinodaphne sesquipedalis* Hook.f. & Thoms. ex Meisn. subsp. *cambodiana* (Lecomte) de Kok, comb. nov, stat. nov.

Actinodaphne sesquipedalis var. *cambodiana* Lecomte, *Archives du Muséum d'Histoire naturelle, Paris*, sér. V., 5: 93 (Lecomte 1913). — Type: **Cambodia**. Krepeuh, Monts Knang, 14°18'9"N, 103°50'40.992"E, alt. 1500 m, IX.1870, *J.B.L. Pierre 627* (lecto-, P[P02035687], first step lectotypification by Tanaros *et al., Thai Journal of Botany* 2: 17 (Tanaros *et al.* 2010), second step lectotypification here; isolecto-, A[A00041110, A00936321], B[B 10 0241815], BM[BM000951003], E[E00386461], F[F0061313F], K[K000350900], NY[NY00354780], P[P01062897, P01880075, P02008331, P02008332, P02008333, P02035673, P02035677, P02035678, P02035683, P02035684, P02035686, P02035688, P02035705, P02194623, P06837464]).

Remarks

This taxon is much better recognised on subspecies level as it has a distinct separated distribution, relative to the other subspecies of this species in Thailand and Peninsular Malaysia.

4. *Dehaasia ferruginea* (H.Liou) de Kok, comb. nov.

Beilschmiedia ferruginea H.Liou, *Contribution à l'Étude systématique et phytogéographique des Lauracées de Chine et d'Indochine* 107 (Liou 1932).

Type specimen. — [**Vietnam**] Annam, Quảng Trị, Massif de Dông Tri, 20°56'35.016"N, 105°51'42.012"E, alt. 800 m, 16.VI.1924, *Poilane 10964* (lecto-, P[P00745626], first step designated by Nguyễn Kim Đào, *Flora of Vietnam* 20: 157 (Nguyễn Kim Đào 2017), second step lectotypification de Kok, *Thai Journal of Botany* 49 (1): 25 (de Kok 2021); isolecto-, A[A00041182], K[K000768684], P[P00745627, P00745628], US[US00099402]).

Remarks

Given this taxon inflorescences shape (type 2, rather than type 3 in *Beilschmiedia*, van der Werff, 2001) it is better placed in the genus *Dehaasia*.

Fig. 15. — Holotype of *Phoebe petelotii* Kosterm. ex de Kok, sp. nov., held at the Muséum national d'Histoire naturelle in Paris (P00752532).

NEOTYPIFICATIONS

Genus *Cinnamomum* Schaeff.

1. ***Cinnamomum curvifolium*** (Lour.) Nees

Systema Laurinarum 80 (Nees 1836); Nguyễn Kim Đào, *Flora of Vietnam* 20: 239 (Nguyễn Kim Đào 2017). — *Laurus curvifolia* Lour., *Flora cochinchinensis* 1: 252 (de Loureiro 1790).

Type specimen. — [**Vietnam**] Thừa Thiên-Huế: Nui Bach Ma, 16°10'0.012"N, 107°49'59.988"E, alt. 1000-1200 m, 21.IV.1939, *Poilane 29889* (neo-, P[P02132202], designated here).

Remarks

This species was first described as *Laurus curvifolia* by Loureiro in his Flora Cochinchinensis (de Loureiro 1790: 252). No Loureiro specimens could be found at the BM and P and Merrill does not mention any in his commentary on the work (Merrill 1935). Therefore, a neotype needs to be selected. The P specimen of *Poilane 29889* which fits well with the original description and has many mature inflorescences and flowers, and is therefore selected here as the neotype.

2. ***Cinnamomum loureiroi*** Nees

Systema Laurinarum 65 (Nees 1836); Merr., *Transactions of the American Philosophical Society* 14: 164 (Merrill 1935); Nguyễn Kim Đào, *Flora of Vietnam* 20: 279 (Nguyễn Kim Đào 2017). — *Laurus cinnamomum* Lour., *Flora cochinchinensis* 1: 249 (de Loureiro 1790), *nom. illeg.*, non *Laurus cinnamomum* L.

Type specimen. — [**Vietnam**] Lâm Dông: Blao, 11°31'43.392"N, 107°48'7.632"E, alt. 800 m, 5.II.1933, *Poilane 21854* (neo-, P[P01748428], designated here).

Remarks

This species was first described as *Laurus cinnamomum* by Loureiro in his *Flora Cochinchinensis* (de Loureiro 1790). As Linnaeus had already published a species with this name, it was renamed by Nees von Esenbeck (1836) as *Cinnamomum loureiroi* Nees. No Loureiro specimens could be found at the BM and P and Merrill does not mention any in his commentary on the work (Merrill 1935). Therefore, a neotype needs to be selected. The P specimen of *Poilane 21854* which fits well with the original description and has many mature infructescences and fruits (for species identification in this genus), and is therefore selected here as the neotype.

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