BLUMEA 47 (2002) 347–362

ADDITIONS TO ASIAN MYRISTICACEAE: ENDOCOMIA, GYMNACRANTHERA, HORSFIELDIA, KNEMA, AND MYRISTICA

W.J.J.O. DE WILDE

Nationaal Herbarium Nederland, Universiteit Leiden branch,
P.O. Box 9514, 2300 RA Leiden, The Netherlands

SUMMARY

In the genus *Horsfieldia* 5 new taxa are proposed, viz. one from Vietnam: *H. micrantha* W.J. de Wilde, a new variety from Thailand: *H. amygdalina* Wall. var. *macrocarpa* W.J. de Wilde, one species from the Philippines: *H. romblonensis* W.J. de Wilde, one species and a new variety both from West Papua: *H. platantha* W.J. de Wilde and *H. subtilis* (Miq.) Warb. var. *auctissima* W.J. de Wilde. Apart from additions and notes to Asian genera in Myristicaceae, a description in English of *Myristica yunnanensis* Y.H. Li is given. *Horsfieldia kingii, Knema curtisii, Myristica cinnamomea,* and *M. yunnanensis* are new records for Thailand; *H. majuscula* is a new record for Borneo.

Key words: *Endocomia, Gymnacranthera, Horsfieldia, Knema, Myristica,* Myristicaceae, Thailand.

CONTENTS

INTRODUCTION

For a large group, like Myristicaceae with c. 350 species in Asia, it is evident that the collecting of new material from up till then unexplored areas may provide material that necessitates changes in the existing taxonomy or likewise represents new taxa. In this article, in the genera *Endocomia*, *Gymnacranthera*, *Horsfieldia*, *Knema*, and *Myristica* new taxa, notes, new records, additions, or modifications to previous treatments of the respective genera are presented.

ENDOCOMIA W.J. de Wilde

NOTE ON ENDOCOMIA IN THE PHILIPPINES

In the Philippines only one vegetatively heterogeneous species, *E. macrocoma* (Miq.) W.J. de Wilde (with subsp. *macrocoma* and subsp. *prainii* (King) W.J. de Wilde) is accepted (see De Wilde, 2000a: 37).

Two fruiting collections from Luzon, Quezon (*Reynoso & Majaducou PPI 21718 & 21784*), have the calyx remaining under the fruit. This character is regarded as important in the species delimitation of *Horsfieldia* and was not seen before in *Endocomia*. However, a possible further division of *Endocomia* on this character in the Philippines is pending the study of more adequate material.

GYMNACRANTHERA (A.DC.) Warb.

NOTE ON GYMNACRANTHERA IN THE ARU ISLANDS

In De Wilde (2000a) 3, 48, Map 2 the general distribution of the genus erroneously leaves out the Aru Is., but several collections of *G. farquhariana* (Hook.f. & Thomson) Warb. var. *zippeliana* (Miq.) R.T.A. Schouten have been made recently in these islands (*Van Balgooy 6603*, *6653*, *6673*, *6683*; *Nooteboom 5871*).

HORSFIELDIA Willd.

ON THE STATUS OF H. AMYGDALINA AND RELATED SPECIES IN THAILAND AND ADJACENT AREAS

In the revision of the genus *Horsfieldia* (De Wilde, 1985a) four related species of the SE Asian mainland are treated: *H. kingii, H. amygdalina, H. thorelii,* and *H. longiflora*. *Horsfieldia thorelii* is now considered synonymous with *H. amygdalina*, but a new species, *H. micrantha*, is added.

Horsfieldia kingii was not mentioned for Thailand before, but this species has been found in recent years in the north. It is readily distinct from the others by a stout habit, large male perianths, initially pubescent, 3–4 mm diam., with 3 or 4 (or 5) lobes, and large fruits (3–)4–6 cm long, with persisting perianth. *Horsfieldia longiflora* is a local endemic species of Central Vietnam, characterised by an elongated synandrium. The remaining, variable, collections were assigned to two arbitrarily segregated species,

H. amygdalina and *H. thorelii*, both accepted for Thailand with the main difference being the size of the male perianth, 1.5–2.3 versus 1–1.5(–1.7) mm long. There is a large variation in fruit size. Through recent collections the supposed difference between these species in Thailand have become more and more questionable, which, in view of the forthcoming treatment of the Myristicaceae for the Flora of Thailand, led me to investigate the whole complex again, including a renewed examination of the specimens from Indochina present in the Paris Herbarium. It appeared that this material, i.e. from Continental India, Bangladesh, Myanmar, Andaman Islands (I have not seen the material from Nicobar Islands, which is named *H. glabra* in Sinha, 1999), Thailand, China, and Indochina, forms one continuously varying group, in which specimens from more western specimens have the largest male perianths, those of East Thailand and Indochina average with smaller perianths. The smallest mature male perianths are found in *Pierre 14* (Oct. 1866, S Vietnam), rendering this specimen distinct, and it is here described as a new species *H. micrantha*. The type of *H. thorelii* has comparatively small perianths, but merges with the large variable continuum, and hence the name is a synonym of *H. amygdalina*. The origin of my former misconception of *H. thorelii* as a distinct species lies in the wrong interpretation of the taxonomy proposed by Lecomte (1909, 1914) for Indochina, which was primarily based on the lobe number and size of the male perianth, viz. 2-lobed and c. 1.5 mm diam. for *H. thorelii* and 3-lobed (rarely 2-lobed) and 1–1.5 mm diam. (in the key, but 1.5 mm diam. in the description) for *H. amygdalina*. Later on it appeared to me that the lobe number cannot be used for distinction, and I wrongly decided that the name *H. thorelii* could be arbitrarily maintained for small-flowered specimens, including the type with male perianth c. 1.5 mm diameter. At present I hold the view that, apart from the related *H. kingii*, in Thailand there conveniently is one large variable species, *H. amygdalina*. In Indochina, besides the widespread *H. amygdalina*, two local species occur, *H. longiflora* (C Vietnam) and *H. micrantha* (S Vietnam). *Horsfieldia amygdalina* in Thailand, besides having a variable large variation in male perianth size, also exhibits a large variation in fruit size, as discussed in the note under var. *macrocarpa*. Very large fruited specimens from N Thailand are here described as var. *macrocarpa*, a new variety. Thus, *Horsfieldia* in SE Asia (excl. Malesia) still comprises 4 related species.

TAXONOMIC TREATMENT OF HORSFIELDIA IN CONTINENTAL SE ASIA (NORTH OF THE ISTHMUS OF KRA)

KEY TO HORSFIELDIA IN SE ASIA

1a. Twigs ridged; leaves distichous. Flowers 2-lobed; androecium broadly and deeply hollowed at apex. Fruit perfectly globose. — Mostly coastal, in marshy forest ..... **1. H. irya**

b. Twigs not ridged; leaves distichous or dispersed. Flowers 2–4-lobed; androecium narrowly hollowed at apex. Fruit ellipsoid. — Not in marshy forest 2

2a. Leaves dispersed. Male perianth 3- or 4-lobed, pubescent. Fruit (3–)4–6 cm long, with persistent perianth ..... **2. H. kingii**

b. Leaves dispersed or distichous. Male perianth 2- or 3- (or 4-)lobed, glabrescent. Fruit 1.5–6 cm long, perianth not persistent 3

3a. Male bud ellipsoid. Fruit c. 1.5 cm long. — C Vietnam (Annam) ..... **3. H. longiflora**
b. Male bud (sub)globose. Fruit 2–6 cm long 4
4a. Male bud c. 1 mm diameter. — S Vietnam ..... **5. H. micrantha**
b. Male bud 1.5(–2) mm diameter. — Widespread ..... **4. H. amygdalina**

1. Horsfieldia irya (Gaertn.) Warb. (1897) 317; W.J. de Wilde (1985b) 55, f. 6; (2000a) 132. — Widespread in SE Asia.

2. Horsfieldia kingii (Hook.f.) Warb. (1897) 308; W.J. de Wilde (1985a) 170.

Horsfieldia hainanensis Merr. (1932) 43.
Horsfieldia tetratepala C.Y. Wu & W.T. Wang (1957) 218.

Distribution — India (Assam, Sikkim), E Nepal, Bangladesh (?), China (Yunnan, Kwangsi, Hainan), Thailand.

Note — The occurrence of *H. kingii* in Thailand became evident through *Maxwell 94-691* (Lamphun, Northern Province), a new record.

3. Horsfieldia longiflora W.J. de Wilde (1985a) 172.
Distribution — Endemic in Central Vietnam (Annam).

4. Horsfieldia amygdalina (Wall.) Warb. (1897) 310; W.J. de Wilde (1985a) 177.

KEY TO THE VARIETIES OF HORSFIELDIA AMYGDALINA

1a. Terminal leaf bud, young twig apices and inflorescences with hairs 0.5–1 mm long ..... **b.** var. **lanata**
b. Hairs much shorter, c. 0.2 mm long 2
2a. Fruit large (3.5–)4–6 cm long; pericarp (when dry) 3–5 mm thick; seed (2–)2.5–4 cm long, with the aril thick-leathery ..... **c.** var. **macrocarpa**
b. Fruit 2–3 cm long; dry pericarp 1–3 mm thick; seed 1.5–2 cm long, with the dry aril membranous ..... **a.** var. **amygdalina**

a. var. **amygdalina**

Myristica amygdalina Wall. (1830) 79, t. 90; Num. list (1832) no. 6797; Hook.f. & Thomson (1855) 160, p.p.; King (1891) 300, pl. 128. — *Horsfieldia amygdalina* (Wall.) Warb. (1897) 310; J. Sinclair (1958) 422 (in synonymy and in notes to *H. bracteosa*); Y.H. Li (1977) 12, f. 3, 5–6; W.J. de Wilde (1985a) 177. — Type: *Wallich Cat. 6797* (KW; iso BM, K; CAL, G, n.v.).
Horsfieldia thorelii H. Lecomte (1909) 99; Lecomte (1914) 100; J. Sinclair (1958) 422 (see note in synonymy of *H. amygdalina*); W.J. de Wilde (1985a) 175, f. 5. — Type: *Thorel s.n.* and *1186* (P) (some of the duplicates are *H. irya*).
Horsfieldia tonkinensis Lecomte (1909) 100; (1914) 101. — Type: *Bon 4272 (4302)* (P).
Horsfieldia tonkinensis var. *multiracemosa* Lecomte (1909) 100; (1914) 102. — Type: *Bon s.n. (4302)* (P).

Distribution — As the species; widespread in Thailand.

b. var. **lanata** W.J. de Wilde (1985a) 179.

Distribution — E Thailand, Cambodia.

c. var. **macrocarpa** W.J. de Wilde, *var. nov.*

A varietate typica fructu maiore 4–6 cm longo, pericarpio in sicco 3–5 mm crasso, semine arillo crasse coriaceo differt. — Typus: *Maxwell 94-620* (BKF, iso L), Thailand.

Twigs towards apex 3–6 mm diam.; bark of twigs lower down coarsely striate, brown-black, lenticellate. Leaf bud and twig apex with dense hairs, 0.1–0.2 mm long. *Leaves* in 3(–5) rows; petiole 15–20 mm long; blade 13–22 cm long. Inflorescences behind the leaves; male c. 10 cm long, paniculate, many-flowered; female 2–3 cm long, 10–20-flowered. *Flowers* glabrous. Male bud (*Maxwell 93-1313*) c. 1.5 mm diam. Female bud ovoid, c. 3 mm long, apex subacute. *Fruits* 1–4 per infructescence, when dry 4–6 by 2.5–3.5 cm; pericarp 3–5 mm thick; seeds (2–)2.5–3.5 by 1.8–2 cm, aril pale brownish creamy on drying, hard-carnose, 0.5–1 mm thick, at apex protruding beyond the seed and coarsely rumpled.

Field notes — Tree 10–16 m, dbh to 37 cm. Bark thickened, roughly vertically cracked, grey-black or dark brown; sap red. Leaves light green underneath. Perianth (green-)yellow, fragrant; anthers tan; ovary light yellow. Fruit green with light yellowish or orange; aril orange(-red).

Distribution — Northern Thailand (Chiang Mai, Lamphun).

Habitat — Understorey tree in mixed seasonal evergreen or deciduous hardwood forest. Granite bedrock; 600–1100 m altitude. Flowering: September to October; fruiting: December to June.

Note — The several fruiting collections readily differ from the abundant collections of the remainder of the material of *H. amygdalina* by a stout habit (thick twigs, with dispersed, comparatively long-petioled leaves) and large fruits. However, there seems to be no sharp distinction or correlation with other characters. As noted in the introduction for var. *amygdalina*, it appeared that the size of the male perianth of this variety can best be regarded as variable, ranging from 1.5–2.3 mm diam.; perianths of *Maxwell 93-1313*, possibly belonging to var. *macrocarpa*, are c. 1.5 mm diam., hence falling within the range of the type-variety. In var. *amygdalina* there also seems to be a continuous variation in fruit sizes, 2–3.5 cm long. The specimens of var. *macrocarpa* are all of a restricted area in northern Thailand.

Specimens studied:
Maxwell 94-620 (type) (fr.); *90-1321* (young fr.); *93-374* (fr.); *96-819* (fr., cf. var. *macrocarpa*, fruit comparatively small, c. 3.5 cm long only); *96-547* (fr.); *89-1053* (female fl.); *89-591* (fr.); *93-1313* (male fl., doubtful, see note).

5. Horsfieldia micrantha W.J. de Wilde, *spec. nov.*

Horsfieldia amygdalina similis, in periantho masculo minuto globoso ca. 1 mm diam. differt. — Typus: *Pierre 14* (P; iso L), S Vietnam, Mt Dinh, near Baria.

Horsfieldia thorelii auct. non Lecomte: W.J. de Wilde (1985a) 175, p.p. for the specimen *Pierre 14* only.

Tree 10–15 m tall. *Twigs* terete, not ridged, towards apex 2.5–5 mm diam., tomentum grey-brown to rusty, early glabrescent, hairs 0.2–0.3 mm long; bark dark (grey-)brown, lower down finely to coarsely striate, not flaking, lenticels small, inconspicuous. *Leaves* in 3–5 rows, early glabrescent; petiole 6–10 by 1.5–2 mm; blade membranous, (elliptic-)oblong, broadest at or slightly above the middle, 9–12 by 3–4 cm, base attenuate, apex acute-acuminate; upper surface olivaceous-brown on drying, lower surface not dotted; midrib slightly to much raised above; nerves 8–12 per side, slightly raised above, marginal arches indistinct; tertiary venation on both surfaces indistinct; leaf bud 10–13 by 3.5 mm, hairs dense, greyish brown to rusty pubescent, 0.2–0.3 mm long. Male inflorescences 3 or 4 times branched, 6–8 by 4–5 cm, common peduncle c. 30 mm, many-flowered, ± thinly pubescent, hairs 0.2–0.3 mm long; *flowers* 2-lobed, in dense clusters of 5–12, glabrous. *Male flowers*: pedicel c. 0.5 mm long, glabrous, at base not articulated; bud globose, 1–1.2 mm diam., cleft to about halfway, lobes 0.1–0.2 mm thick. Androecium transversely short ellipsoid-globose, c. 0.6 by 0.8 mm, laterally slightly flattened; anthers c. 8, sessile, free apices to 0.1 mm long, towards the apex incurved over a rather narrow central cavity c. 0.4 mm deep; androphore narrow, up to 0.2 mm long. *Female inflorescences, flowers,* and *fruits* not known.

Distribution — S Vietnam; known only from the type.

Habitat & Ecology — Hills, at low altitude. Flowering: October.

Note — Close to the widespread, variable, *H. amygdalina*, but distinguishable by its extraordinary small male perianths, c. 1 mm diameter.

ADDITIONS TO HORSFIELDIA IN MALESIA

Horsfieldia leptantha W.J. de Wilde (1985b) 137; (2000a) 144.

For this New Guinean species the female flowering and fruiting collection *Yumte 135* (Vogelkop, Ayawasi, Feb. 1995) permits the description of the female flowers. *Female inflorescences* below the leaves, c. 5 by 4 cm, with light rusty hairs, c. 0.5 mm long, common peduncle c. 4 mm only, flowers in loose clusters of 2 or 3. *Flowers* 2-lobed, with rusty hairs c. 0.5 mm; pedicel c. 2.5 mm long, at base not articulated; bud globose, c. 2.5 mm diam., glabrescent at apex, cleft to about halfway, lobes rather rigid, c. 0.2 mm thick at apex. Ovary globose, of hard consistency, c. 1.5 mm diam., hairs dense, appressed, rufous-rusty, 0.2(–0.3) mm long. *Fruits* c. 5 per infructescence, short pyriform to subglobose, 2–2.3 cm diam., finely granulate, with larger lenticels, hairs rather sparse, c. 0.2 mm long; pericarp ± woody, thick, at one side nearly 10 mm thick.

Note — Infructescence and female flowering inflorescences found mixed on a single twig.

Horsfieldia majuscula (King) Warb. (1897) 315; W.J. de Wilde (1986) 48; (2000a) 147.

The male flowering collection *S 72979*, distributed to K, KEP, L, MO, S, SAN, from lowland in Kuching Division, W Sarawak, belongs to this species; it was hitherto known only from Peninsular Malaysia and N Sumatra. Distinctive is the obconical thick-walled bud, with an elongate, ± 3-angular synandrium.

With the regional key to the species for Borneo (De Wilde, 2000a) and the key in the Tree Flora of Sabah and Sarawak (De Wilde, 2000b) one arrives in the vicinity of species with a similar short indumentum and stout habit like *H. obscura* or *H. subalpina*, both differing in a subglobose male bud with thin lobes, or at *H. xanthina* (subsp. *macrophylla)*, a species apparently taxonomically close to *H. majuscula*, occurring in mountainous areas in E Sarawak and Sabah; also *H. coriacea* from C Sulawesi is taxonomically related. The latter three species share similar male flowers. Now that *H. majuscula* occurs in Borneo, some difficult to name fruiting collections may belong to the present species, e.g. *S 28083* discussed under *H. obscura* (De Wilde, 1986), or *S 52513* provisionally identified as *H. subalpina*. A definite identification of such specimens has to wait for more fruiting collections matching the *H. majuscula* male specimen from W Sarawak, for comparison.

Horsfieldia platantha W.J. de Wilde, *spec. nov.* — Fig. 1a–h

> *Horsfieldia pachycarpa* similis, habitu plerumque minus valido, laminis 10–15 cm longis, periantho masculo plano obovato in ambitu ca. 2 mm longo 1.5 mm lato basi gradatim in pedicello transienti distaliter glabrescenti, androecio plano sessili, thecis 20–22 mutue connatis differt. — Typus: *Ridsdale CER 2549* (L; iso BO), West Papua.

Tree. Twigs terete, not ridged, towards apex 2–3 mm diam., soon glabrescent, hairs c. 0.1 mm long. *Leaves*: petiole 5–15 mm long; blade membranous, elliptic, 9–15 by 3.5–6 cm, apex c. 10 mm long, acuminate, base narrowly cuneate, lower surface glabrous, not dotted; leaf bud largely broken off, hairs c. 0.1 mm long. *Male inflorescences* below the leaves where twigs are c. 4 mm thick; paniculate, 5–8 by 3 cm, with stellate scale-like hairs 0.1–0.2 mm long, peduncle 2–3 cm by 1.5 mm; lateral branches few, hardly branched; *flowers* mostly solitary, 2- (or 3-)lobed, largely glabrescent, hairs stellate, c. 0.1 mm long. *Male flowers*: pedicel 3–5 mm long, at apex dilated; bud flattened, in outline obovate, 2–2.5 by 2 mm, apex faintly angular or broadly rounded, at base gradually passing into pedicel, cleft to c. 1/2, lobes thin, slightly out-curving. Androecium flat, almost square, c. 2 by 1.5 mm, at apex slit-like cleft for c. 1/5 (hence c. 0.4 mm deep); anthers 10 or 11, erect, connate, free apices c. 0.1 mm long only, base slightly sagged over the broad, (0.1–)0.2 mm long, androphore. *Female inflorescences*, *flowers*, and *fruits* not known.

Distribution — NW West Papua: Wapoga Drilling Camp, 3° 08' S, 136° 34' E; known from a single collection.

Habitat & Ecology — Ridge forest, c. 1300 m altitude. Flowering: April.

Notes — 1. The comparatively delicate fallen branch fragment is reminiscent of other less robust *Horsfieldias* from the same area, like *H. basifissa* W.J. de Wilde, *H. pilifera* Markgr., *H. sinclairii* W.J. de Wilde, *H. schlechteri* Warb., and *H. subtilis* (Miq.) Warb., but differs in a basally tapering male perianth as is found also in *H. pachycarpa*, a montane species. This latter species may have occasionally similar rather smallish male flowers, but is always considerably stouter in twigs, leaves, and inflorescences. In the revision of *Horsfieldia* (De Wilde, 1985b under *H. pachycarpa*) a number of specimens with small fruits is discussed, but all these are considerably stouter in habit as compared to *H. platantha*. The epithet *platantha* is chosen after the elongated flat male perianths, hardly collapsing on drying.

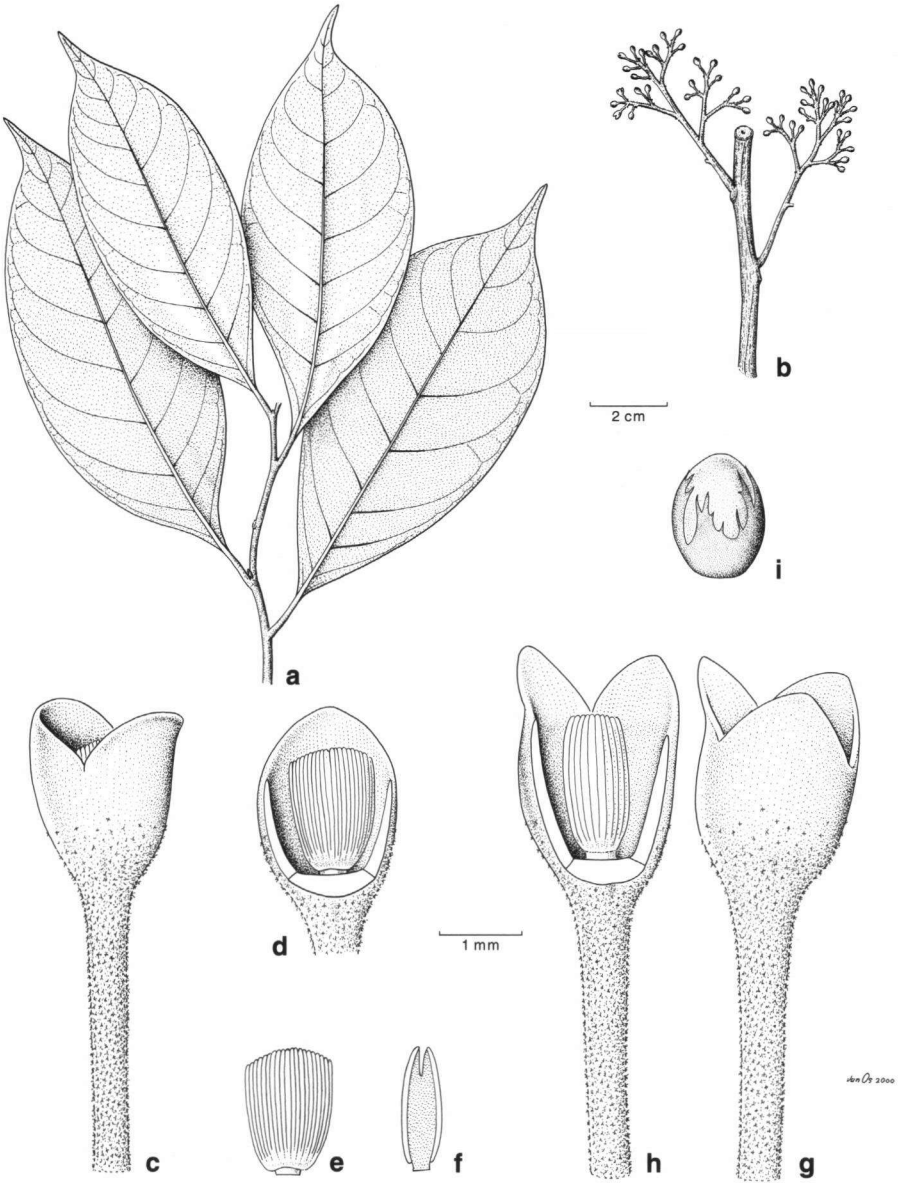

Fig. 1. *Myristica platantha* W.J. de Wilde. a. Habit of leafy twig; b. lower part of twig with two male inflorescences; c. male flower; d. ditto, opened, showing androecium; e & f. androecium lateral view and schematic in longitudinal section; g & h. an odd 3-lobed male flower, with androecium ± 3-angular. — *Knema* cf. *kinabaluensis* J. Sinclair. i. Seed with reduced aril (see text) (a–h: *Ridsdale CER 2549*, L; i: *Madani SAN 133968*, L).

2. A delicate female specimen (ovary with few stellate hairs), *LAE (Wiakubu et al.) 50509* from Papua New Guinea, West Sepik, may belong to *H. platantha.*

3. In keys to male flowering *Horsfieldia* (De Wilde, 1985a, 2000a) *H. platantha* goes either with *H. subtilis* (a species with a delicate inflorescence, but with a broader perianth), or with *H. pachycarpa* (a species much stouter in all parts).

Horsfieldia romblonensis W.J. de Wilde, *spec. nov.*

Horsfieldia polyspherula (Hook.f. emend. King) J. Sinclair similis, in laminae superioris nervis lateralibus non elevatis, periantho masculo maiore c. 2.5 mm diam. differt. — Typus: *PPI (Stone, Reynoso & Fernando) 6782* (L; iso PNH), Philippines.

Tree 12–20 m. *Twigs* terete, not ridged, 3–4 mm diam., brown, glabrescent, hairs c. 0.1 mm long; bark striate with few small lenticels. *Leaves*: petiole c. 1.5 cm long; blade chartaceous, elliptic-oblong, 10–15 by 3.5–7 cm; upper surface greenish on drying, lower surface early glabrescent, cinnamon discolorous; midrib slender; lateral nerves 8–12 per side, flat above; leaf bud 10–12 by c. 2 mm, hairs 0.1 mm long. *Male inflorescences* axillary to lower leaves, paniculate, 6–8 by 2.5–4 cm, largely glabrescent, hairs 0.1–0.2 mm long; flowers glabrous, in loose clusters of 2–5; common peduncle c. 1 cm long; bracts caducous. *Male flowers*: pedicel tapered, 2(–3) mm long; bud subglobose, carnose, 2–2.5 mm diam., cleft 1/2(–2/3). Androecium broadly obovoid-subglobose, 3-angular in cross section, 1.2–1.3 mm diam.; anthers 10–12 (thecae 20–24), 0.5–0.6 mm long, free for the upper half, column short, at apex little excavated; androphore broadly tapered, 0.5–0.6 mm long, glabrous. *Female inflorescences, flowers,* and *fruits* not known.

Distribution — Central Philippines: Romblon Island, known from 2 collections.

Habitat & Ecology — Lowland forest (with *Agathis*) on red-brown soil over ultrabasic. Flowering: May to June.

Note — This species resembles *H. polyspherula* in many characters, but is distinct in having much larger male buds. Apparently it occupies a restricted area, outside the wide area of *H. polyspherula* (West Malesia, East to Mindanao, not in Palawan). Within the latter area a few related species with the lateral nerves not raised on the upper leaf surface have been recognised, like *H. ridleyana* (King) Warb., *H. obtusa* W.J. de Wilde, and *H. disticha* W.J. de Wilde. *Horsfieldia romblonensis* keys out near these species by bark of older twigs not cracking, and by larger male buds.

Horsfieldia subtilis (Miq.) Warb. var. **auctissima** W.J. de Wilde, *var. nov.*

A var. *subtili* in inflorescentiis masculis maioribus 10–12 cm longis, periantho masculo c. 3 mm lato, fructu maiore ellipsoideo c. 2 cm longo differt. — Typus: *Sands 6165* (L; iso BO, K), West Papua.

Tree 10–20 m tall. Twigs towards apex 3–4 mm diam., glabrescent, hairs (0.1–)0.3 mm long. *Leaves*: petiole 1.5–2 cm long; blade membranous, glabrescent, 20–25 by 7.5–10 cm; leaf bud 1.5–2 by 2–4 mm, hairs 0.1–0.3 mm long. *Inflorescences* among or below the leaves, in male 10–12 cm long. *Male flowers*: pedicel 3 mm long; bud slightly flattened, c. 2.5 by 3 mm, cleft c.1/2. Androecium flattened, broadly obovate-subcircular in outline, c. 1.5 mm diam., c. 0.8 mm thick; anthers c. 24, free apices

c. 0.1 mm long, apical slit c. 0.4 mm deep; androphore c. 0.4 mm long. Infructescences 3 cm long, few-fruited; *fruits* ellipsoid, 2–2.2 by 1–1.3 cm, black on drying.

Field notes — Flowers yellow; fruits yellow.

Distribution — West Papua: Vogelkop.

Habitat & Ecology — Limestone area, 75–450 m altitude. Flowering: February; fruiting: April.

Notes — 1. *Horsfieldia subtilis* a variable, complex species, is characterised by the male perianth wider than long, at apex broadly rounded or truncate. Hitherto four varieties were recognised, and recently collected very stout specimens here described as var. *auctissima* represent a fifth one. Delimitation and status of the varieties remain rather obscure, but var. *auctissima* marks the striking differences within *H. subtilis* in Vogelkop.

2. Variety *auctissima* resembles var. *aucta* in its large fruits, but the latter differs in a lesser stout habit and smaller leaves. Stout, large-leaved specimens do occur in var. *subtilis*, but these have smaller fruits and smaller male inflorescences, and distinctly smaller male perianths.

3. It should be noted that *H. subtilis*, through its var. *auctissima*, now keys out in the general key for male specimens (De Wilde, l.c.) also in the lead to species with male inflorescences more than (5–)8 cm long, in the vicinity of *H. psilantha* W.J. de Wilde, a species from E New Guinea, different in various ways.

KEY TO THE VARIETIES OF HORSFIELDIA SUBTILIS

1a. Male perianth c. 2 mm wide. Fruits globose or subellipsoid, c. 1 cm long, pseudostalk (almost) absent. — Whole of New Guinea ..... var. **subtilis**
b. Male perianth 2–3 mm wide. Fruits short-ellipsoid, including pseudostalk (if present) more than 1.3 cm long 2
2a. Male inflorescences c. 10 cm long; perianth c. 3 mm wide. Fruits c. 2 cm long. Stout, large-leaved plants. — Vogelkop ..... var. **auctissima**
b. Male inflorescences less than 10 cm long; perianth smaller. Fruits c. 1.5 cm long 3
3a. Leaves chartaceous, elliptic, 6–9 cm long. Pseudostalk of fruit 2–3 mm long. — Limestone area. West Papua: SW Vogelkop; 200–300 m ..... var. **calcarea**
b. Leaves coriaceous or membranous, elliptic-oblong, 10–22(–26) cm long. Pseudostalk of fruit 0–3 mm long. — Papua New Guinea; 600–1000 m 4
4a. Leaves membranous. (Female) perianth glabrous inside ..... var. **aucta**
b. Leaves coriaceous. (Female) perianth hairy inside ..... var. **rostrata**

HORSFIELDIA OBSCURA AND H. COSTULATA IN PALAWAN

These two species, of which the first was accepted with a considerable variation in fruit-size, are vegetatively and in fruit similar. *Horsfieldia obscura* is described from Borneo; *H. costulata* occurs in Sulawesi and the Philippines (De Wilde, 2000a). For both species the occurrence in Palawan is mentioned. However, recent accessions from Palawan necessitated a closer study of these species, which confirmed that they are distinct in their mature male flowers (the perianth of *H. costulata* is smaller, and

thinner). The sole specimen *PPI 11212* from Palawan on which the record of *H. costulata* for Palawan was based should be relegated to *H. obscura*. As the two species are very similar in fruit, for the naming of fruiting specimens, their provenance should be considered also.

Horsfieldia obscura W.J. de Wilde (1986) 42; (2000a) 153.

Male flowers: pedicel often somewhat tapering, (1–)1.5–2 mm long, about as long as perianth; perianth firm, 2–2.5 mm diameter.

Distribution — Borneo: E Kalimantan; possibly Sarawak, Sabah; Philippines: Palawan (*PPI 11212, 13321*; *Soejarto c.s. 6584*).

Horsfieldia costulata (Miq.) Warb. (1897) 350; W.J. de Wilde (1986) 38; (2000a) 105.

Male flowers: pedicel slender, terete, c. 0.5 mm long, shorter than the perianth; perianth membranous, 1.5–2 mm diameter.

Distribution — Sulawesi; Philippines (not in Palawan).

KNEMA Lour.

ADDITIONS TO KNEMA IN THAILAND

Knema globulatericia W.J. de Wilde (1979) 409.

Fruits are now known from *Wongprasert s.n.* (*SN 122226*). Fruits subsessile, in clusters of 2–4, broadly ellipsoid, c. 2 by 1.7 cm, dry pericarp 1–1.5 mm thick, with dense hairs 0.3–0.5 mm; fruiting pedicel 1(–2) mm long; perianth subpersistent. From the perianth remaining under the fruit can be inferred that female flowers are subsessile, c. 5 mm long.

Knema cf. **globularia** (Lam.) Warb. (1897) 601.

The collections *Van Welzen* (with *Forest Research & Development Unit*) *109* (in L) and *Chayamarit c.s. T 30367* (in BKF), both male, can provisionally be named 'a form of *K. globularia*'. They are distinct by having larger leaves without a blackish lustre on drying, and shorter hairs on the perianth, only c. 0.1 mm long.

Knema curtisii (King) Warb. var. **curtisii**; W.J. de Wilde (1979) 418, f. 9a; (2000a) 254.

This is a new record for Thailand (*Maxwell 87-524*; *Smitinand s.n. SN 39081*; both from Peninsular Province).

Knema sp. — *Praynna s.n* (*SN 38972*) from Lamphan, Northern Province, is a leafy twig with a detached coarsely hairy fruit, c. 3.6 by nearly 2.4 cm, the leaves are membranous, sparsely hairy, glabrescent beneath. It cannot be matched with any other material and likely represents an undescribed species.

ADDITIONS TO KNEMA IN MALESIA

Knema glomerata (Blanco) Merr. (1917) 81; W.J. de Wilde (1979) 437; (2000a) 267.

Knema glomerata was accepted by me as a variable species endemic to the whole of the Philippines (including Palawan), with one questionable collection from remote NE Sarawak (Miri District) and one from Seram.

A recent collection, *PPI (Fuentes & De la Rosa) 38936*, from Calayan Is., north of Luzon, a conspicuously glabrous plant, with fruits, is tentatively referred to *K. glomerata*.

The above-mentioned collection from Miri District, *S 29419*, with male flowers, has recently been supplemented with an exactly similar male collection, *Huber s.n.*, from about the same locality. These two specimens are distinct from the remainder of the collections of *K. glomerata* by having leaves narrowed to the base in the lower two-thirds and a more membranous texture. Additional fruiting material is needed to estimate whether they represent a distinct taxon.

Knema cf. **kinabaluensis** J. Sinclair (1961) 229; W.J. de Wilde (2000a) 272.

The specimen *SAN 133968 (Madani)*, from Tongod District, on a ridge at c. 700 m, in L with a detached fruit c. 4.5 by 3 cm, with mealy indumentum (hairs 0.1–0.2 mm long), fruiting pedicel c. 3 mm long, keys out to *K. kinabaluensis*. Its provenance is somewhat deviating, but more particularly the aril of the seed, which is reduced in size and exceptionally deeply incised (see Fig. 1i) and approaching the aril of *Myristica*, is noteworthy. Lack of additional material prevents further assessment of the status of this material. In *Myristica* the New Guinean *M. ingens* (Foreman) W.J. de Wilde is characterised by a similarly much reduced aril.

MYRISTICA Gronov.

ADDITIONS TO MYRISTICA IN THAILAND

Myristica cinnamomea King (1891) 292; W.J. de Wilde (2000a) 431.

This is a new record for Thailand (*Puudja 535, Niyomdham et al. 4647, Sangkhachand et al. 1092*; all from Narathiwat, Peninsular Province).

Myristica yunnanensis Y.H. Li (1977) 13, f. 2: 7–12; (1979) 190, t. 87; W.J. de Wilde (1997) 188. — Fig. 2

After the discussion (De Wilde, l.c.) of the first collection of this species for northern Thailand, made in 1973 (*Geesink c.s. 5729*, fruits), a second, recent collection (*Maxwell 95-510*, male flowering) has become available. Both collections are from the same area. This confirms the occurrence of *M. yunnanensis* in northern Thailand, although authentic Chinese material has not been studied for comparison. As only descriptions in Chinese are available a description in English follows here:

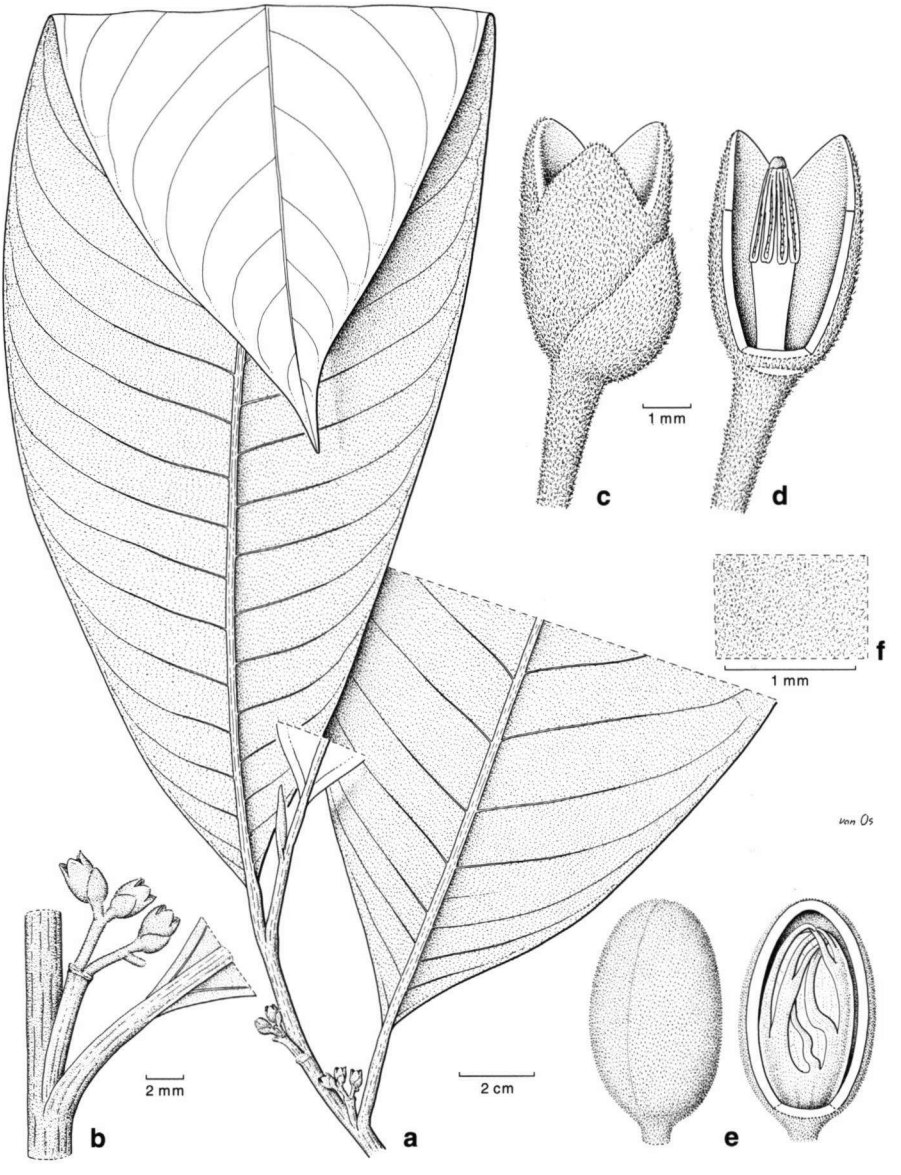

Fig. 2. *Myristica yunnanensis* Y.H. Li. a. Habit of male flowering twig; b. male inflorescence; c. male flower; d. ditto, opened, showing androecium; e. fruit; f. detail of lower leaf surface with dense short-haired indumentum (a–d: *Maxwell 95-510*, BKF; e & f: *Geesink, Phanichapol & Santisuk 5729*, L).

Tree 8–20 m. *Twigs* 3–5 mm diam., glabrescent, hairs c. 0.1 mm long; older twigs bright (grey-)brown, striate, not flaking; lenticels inconspicuous or absent. *Leaves* membranous, elliptic-oblong, 25–40 by 9–14 cm, base cuneate, apex acute-acuminate; upper surface greenish brown, lower surface grey cinnamon, with very dense scale-

like hairs c. 0.1 mm long; not papillose; dots absent; midrib flat above, lateral nerves 20–25 per side, at c. 70° with the midrib, flat, lines of interarching and venation faint; petiole 20–25 by 3–4 mm; leaf bud c. 20 by 4 mm, hairs c. 0.1 mm long. *Inflorescences* in male: paniculate, in between the leaves; hairs c. 0.1 mm long; bracts 1–1.5 mm long, caducous; peduncle 10–15 mm long, branches few, to 5 mm long, flowers solitary or to 3(–5)-clustered, buds of variable sizes. *Male flowers*: pedicel c. 4 mm long, bracteole c. 4 mm long, tardily caducous; buds ovoid-oblong, c. 6 by 4(–4.5) mm, cleft c. 1/3, lobes c. 0.5 mm thick. Androecium (5–)6 mm long; androphore tapering to below, 3–3.5 mm long, glabrous; synandrium narrowed to the apex, 2.5(–3) mm long, at base c. 1.5 mm wide, anthers 8 (thecae c. 16), distinctly spaced, sterile apex c. 0.3 mm long, blunt, at apex irregularly lobed, glabrous. *Female flowers* not known. *Infructescences* short; *fruit* mostly solitary (?), ellipsoid(-oblong), 6–6.5 by 3.5–4 cm, hairs dense, shaggy, c. 1 mm long; dry pericarp c. 5 mm thick; seed 4.5 cm long; fruiting pedicel short.

Field notes — Bark thin, roughened and with fine pustular lenticels, dark grey. Leaves silvery-bronze or ochrish underneath. Male inflorescences with axes, bracts and calyx light yellowish cream, outside with brown hairs; anther locules light orange. Fruit valves green, aril red, seed brown.

Distribution — S China (Yunnan), N Thailand: Chiang Mai Province.

Habitat & Ecology — Hill dipterocarp forest, or shaded in understorey of seasonal mixed primary evergreen-deciduous hardwood forest; shale bedrock; 575–700 m altitude. Flowering: (Thailand) August; fruiting: (Thailand) June.

ADDITIONS TO MYRISTICA IN THE PHILIPPINES

Myristica agusanensis Elmer subsp. **agusanensis**; De Wilde (2000a) 398.

Synonym: *Myristica laevis* W.J. de Wilde subsp. *badia* W.J. de Wilde (1997) 172; (2000a) 509.

Through the collections *PPI 37842, 38067* this species is now also known from Palawan.

Myristica cagayanensis Merr. ('Sept. 1920', Jan. 1921) 255; W.J. de Wilde (1997) 154; (2000a) 426.

Through the collection *PPI 26033* (Batan Is.) the fruit in this species appears somewhat larger as previously described, up to 5 cm long (instead of 3–4 cm long), and may also be glabrescent. Generally, the fruit of *M. cagayanensis* is very short pubescent, the more conspicuous so in specimens from Taiwan. These additions do not essentially alter the identification with the keys presented in 1997 and 2000a.

Myristica cumingii Warb. (1897) 442, t. 13, f. 1, 2; W.J. de Wilde (2000a) 446. — Lectotype (selected here): *Cuming 1570* (holo G-DC; iso G-Boissier, B†, FI, K, L, LE, M, P, W).

Myristica cumingii was described with four syntypes: *Cuming 1570* (male), *908* (fr.), *Vidal 854* (fr.), *1679* (fr.), of which *Cuming 1570* clearly has inflorescences with the typical long peduncle with at the end one or two sessile scar-covered *Knema*-like brachyblasts. This collection is from Mindoro and identical with e.g. two other male collections from Mindoro: *Ramos BS 40910* and *Santos 5329*.

Myristica cumingii may be confused with *M. agusanensis*, also a species with a peduncled male inflorescence, branched, but not forming brachyblasts. The female inflorescences and infructescences are sessile in *M. cumingii*, short-peduncled in *M. agusanensis*.

Myristica laevis W.J. de Wilde (1997) 170; (2000a) 508.

This species was described with two subspecies, mainly distinguished by differences in the fruit. The type of subsp. *laevis*, however, is a male flowering specimen, and that of subsp. *badia* a fruiting specimen. Closer study of the material and additional new collections has convinced me that the additional fruiting specimen of subsp. *laevis* (not the type on which the characters used in the key to the subspecies were mainly based) can better be regarded as belonging to *M. agusanensis* subsp. *agusanensis*. This implies that *M. laevis* subsp. *badia* can no longer be maintained, and is herewith placed in the synonymy of *M. agusanensis*.

Myristica umbellata Elmer (1913) 1816; W.J. de Wilde (2000a) 600.

The fruit may reach 6 cm in length, as seen in *PPI 38164*. In De Wilde, l.c., it was described as 4(–5) cm long.

ADDITIONS TO MYRISTICA IN NEW GUINEA

Myristica possibly new species, close to **M. crassipes** Warb.; see De Wilde (2000a) 442.

This concerns two collections made in 1998: *Ridsdale 2500 & 2627*; both from montane area in NW Papua, 3°–3° 30' S, 136° 30' E. *Ridsdale 2500* consists of detached fruits only and is possibly identical with *Ridsdale 2627*. The latter has immature fruits, stout fruiting pedicels, a stout peduncle, c. 5 mm long, and leaves 11–20 cm long. The fruits of *Ridsdale 2500* are ± mature, c. 5 cm long, the fruiting pedicels more slender as compared to those of *2627*. Both collections key out near *M. crassipes*, which generally has more distinctly angled twigs and smaller leaves. Probably they represent a new taxon, but for a formal description more material including flowers is needed. The specimens are filed in L as *Myristica spec. nov.? aff. M. crassipes* Warb.

Myristica mediovibex W.J. de Wilde (1995) 301; (2000a) 525.

In De Wilde (2000a) the hairs of the leaf bud are confusingly described; it should read: hairs 1–1.5 mm long (var. *mediovibex*) or c. 0.1 mm long (var. *kosteriana*).

ACKNOWLEDGEMENTS

I thank the keepers of BK, BKF, and P for allowing me to visit their herbaria to examine Myristicaceae and BKF and P for sending critical material on loan to Leiden. Jan van Os made the drawings and Jan Frits Veldkamp prepared the Latin diagnoses for the new taxa. Discussion with J.F. Maxwell (Chiang Mai) incited the re-definition of *Horsfieldia amygdalina*.

REFERENCES

De Wilde, W.J.J.O. 1979. New account of the genus Knema (Myristicaceae). Blumea 25: 321–478.

De Wilde, W.J.J.O. 1985a. A new account of the genus Horsfieldia (Myristicaceae), pt 1. Gard. Bull. Sing. 37: 115–179.

De Wilde, W.J.J.O. 1985b. A new account of the genus Horsfieldia (Myristicaceae), pt 2. Gard. Bull. Sing. 38: 55–144.

De Wilde, W.J.J.O. 1986. A new account of the genus Horsfieldia (Myristicaceae), pt 4. Gard. Bull. Sing. 39: 1–65.

De Wilde, W.J.J.O. 1995. Census of Myristica (Myristicaceae) in New Guinea. Blumea 40: 237–344.

De Wilde, W.J.J.O. 1997. Notes on southeast Asian and Malesian Myristica and description of new taxa (Myristicaceae), with keys arranged per geographical area (New Guinea excepted). Blumea 42: 111–190.

De Wilde, W.J.J.O. 2000a. Myristicaceae. Flora Malesiana 14, 1: 1–634.

De Wilde, W.J.J.O. 2000b. Myristicaceae. In: E. Soepadmo & L.G. Saw (eds.), Tree Flora of Sabah and Sarawak 3: 335–473. Kuala Lumpur, Kepong, FRIM.

Elmer, A.D.E. 1913. Four score of new plants. Leafl. Philipp. Bot. 5: 1751–1853.

Hooker, J.D. & T. Thomson. 1855. Flora Indica. London.

King, G. 1891. The species of Myristica of British India. Ann. Roy. Bot. Gard. Calcutta 3: 275–331, pl. 1–174.

Lecomte, H. 1909. Les Myristicacées d'Indo-Chine. Not. Syst. 1: 98–101.

Lecomte, H. 1914. Myristicacées. In: H. Lecomte, Flore Générale de l'Indo-Chine 5, 2: 97–106. Paris.

Li, Y.H. 1977. In: C.Y. Wu (ed.), Fl. Yunnanica 1, 13: 1–14. Science Press, Beijing.

Li, Y.H. 1979. In: Y. Tsiang & P.T. Li (eds.), Fl. Reip. Pop. Sinica 30, 2: 176–205. Science Press, Beijing.

Merrill, E.D. 1917. Contributions to our knowledge of the flora of Borneo. J. Straits Branch Roy. Asiat. Soc. 76: 75–117.

Merrill, E.D. 1921, 'Sept. 1920'. New or noteworthy Philippine plants, XVI. Philipp. J. Sci 17: 239–323.

Merrill, E.D. 1932. Lingnan Sc. J. 11 (not seen).

Sinclair, J. 1958. A revision of the Malayan Myristicaceae. Gard. Bull. Sing. 16: 205–466.

Sinclair, J. 1961. The genus Knema (Myristicaceae) in Malaysia and outside Malaysia. Gard. Bull. Sing. 18: 1–327.

Sinha, B.K. 1999. Flora of Great Nicobar Islands: 359–362. Dehra Dun.

Wallich, N. 1828–1849. A numerical list of dried plants in the East India Company's museum. London.

Wallich, N. 1830. Plantae asiaticae rariores 1, 4: 69–84. London.

Warburg, O. 1897. Monographie der Myristicaceen. Nova Acta, Abh. der Kaiserl. Leop.-Carol. Deutschen Akademie der Naturforscher 68: 1–680. Halle.

Wu, C.Y. & W.T. Wang. 1957. Research on tropical and subtropical flora of Yunnan I. Acta Phytotax. Sin. 6: 183–254.