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NOTES ON SOUTHEAST ASIAN AND MALESIAN MYRISTICA AND DESCRIPTION OF NEW TAXA (MYRISTICACEAE)
With keys arranged per geographical area (New Guinea excepted)

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SUMMARY

Following the introductory sections, a general key, and regional keys, noteworthy observations are given for selected species of *Myristica* covering the whole distributional area of the genus west of New Guinea. New taxa, i.e. species (14), subspecies (10), and varieties (2) are fully described and annotated. All accepted names are arranged alphabetically, followed by an index.

CONTENTS

INTRODUCTION

With the completion of the revision of all *Myristica* material in the Leiden collection, with extension to most of the materials of the Kew herbarium and incidental loans of important collections of other herbaria, quite a number of new taxa were still to be published. I have taken this opportunity to present an alphabetically arranged list of the now accepted *Myristica* species, amplified with a general key, and regional keys to the species. I hope that species-identification through the regional keys will be easier than digging through a complicated and lengthy key covering the whole genus.

Meanwhile, all-embracing keys for large regions are presented as well, because these largely may reflect – although subjectively so – the presumed natural relationships of the species in a larger context.

I have treated the region New Guinea, which contains by far the most species of the genus, in a separate article (De Wilde, 1995) because, as also agreed upon by all previous authors including Warburg (1897) and Sinclair (1968), the species of New Guinea (very few excepted) are distinct from those of the remainder of the distributional areas of *Myristica*, and thus the general key to the latter area could be alleviated considerably.

The genus *Myristica* is distributed from S India through Sri Lanka and Continental SE Asia (few species, incl. one in the mainland of S China) through Malesia far into the Pacific and N and NE Australia.

Some years ago (De Wilde, 1990) I published an account of *Myristica* in the Moluccas, and in the present publication a few additions regarding this area are given. Accounts for Australia (De Wilde, 1991; Jessup & De Wilde, 1993) and the Pacific (De Wilde, 1994) were published as well.

The present publication contains also a new complete treatment of the group of much related small-leaved *Myristicas* of S India and Sri Lanka, of which I came to a taxonomic solution quite at variance with that of Sinclair (1968).

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ACKNOWLEDGEMENTS

It is evident that my studies in Myristicaceae, and in particular *Myristica*, have always been heavily leaning on the extensive precursory works by the late James Sinclair. Without these an acceptable treatment of the by now amply augmented herbarium collections would have taken a still much longer period.

I thank J.H. van Os (L) for his skilful drawings, including detailed drawings of magnified lengthwise opened flowers. My colleague J.F. Veldkamp generously provided the translations into Latin of the diagnoses of the new taxa.

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GENERAL KEY FOR CONTINENTAL SOUTHEAST ASIA, MALESIA, AND AUSTRALIA (excl. New Guinea and the Pacific)

(Applicable for male flowering specimens; incidentally also fruit characters are used)

Note: of several species male flowers (and inflorescences) are not known, and the place in the key for these species may be erroneous

1a. Inflorescences (preferably of male plants) essentially of the paniculate-type, variously shaped as defined under lead 2; inflorescences either 1) sessile and simple and few-flowered or 2) branched and few- or many-flowered, and with flattened main peduncle; the whole inflorescence lasting one or only a few flowering seasons. When the peduncle is short then the distinction from lead 1b (*Knema*-type) may be arbitrary (e.g. in *M. teijsmannii*) 2

b. Inflorescences of the *Knema*-type, i.e. consisting of a sessile or shortly peduncled simple or 2–4-furcate thickish, ± woody, scar-covered ('condensed') short-shoot, the peduncle up to 5 (or very rarely to 15) mm long, smooth and terete; inflorescences lasting several flowering seasons, each season producing new flowers at the top of the short-shoots 39

2a. Male inflorescence paniculate, i.e. ramified and with distinct main peduncle and the flowers (usually of varying age and size) arranged into fascicles or subumbels at the end and along the ramifications; lateral branches and central branch usually present, but if absent and inflorescence unbranched, then the flowers fascicled into a single subumbel not growing out into a scar-covered short-shoot 3

b. Male inflorescences either simple, few-flowered, or branched, the branches ending in (rather) slender spike-like scar-covered short-shoots, producing new flowers at the top (these terminal short-shoots resembling inflorescences of the *Knema*-type, but generally more slender) 32

3a. Mature leaves on lower surface glabrous or early glabrescent, or with scattered (distinctly spaced, not touching nor interwoven) weak hairs 0.1–0.3 mm long or less 4

b. Mature leaves densely pubescent beneath, but hairs may be very small (lens!); old leaves sometimes glabrescent; very thin 'arachnoid' covering appearing as if leaf glabrous is entered in the alternative lead 26

4a. Tomentum of leaf bud (terminal bud) with hairs 0.1–0.2(–0.3) mm long or less; apex of young twigs and inflorescences with dense or sparse similar tomentum, or glabrescent 5
b. Tomentum composed of conspicuous hairs, (0.3–)0.5 mm long or more (appressed hairs may appear as if shorter) 21
5a. Mature perianth in bud (preferably to be seen in male) generally distinctly angular, i.e. sharply angular or winged along the valve sutures. Leaves of moderate size, generally few-nerved (nerves 8–13 pairs). *S Thailand, W Malesia* .... **M. elliptica** Wall. ex Hook. f. & Thomson
b. Perianth angular or not, neither sharply angular nor winged. Leaves various 6
6a. Plant of delicate habit. *India (western Peninsula)* ..... **M. malabarica** Lam.
b. Plant various. *Malesia* 7
7a. Leaves generally large and comparatively broad, 16–44 by 8–14.5(–18) cm, top blunt or acute, not acute-acuminate, base ± rounded or subcordate; nerves (16–) 20–28 pairs; lower surface papillose. *Borneo* ..... **M. papyracea** J. Sinclair
b. Leaves large or small, usually comparatively narrow, leaf index more than 2; tleaves either 1) large, nerves 16–33 pairs, top acute or acute-acuminate (*M. extensa, M. frugifera, M. maxima*) or 2) generally smaller, nerves 10–22(–30) pairs, with top acute-acuminate, or acute or blunt in most of *M. gigantea* .. 8
8a. Plant almost completely glabrous; stoutish. [Male flowers not known; infructescence partly unknown.] *Moluccas: Ceram* ... **M. perlaevis** W. J. de Wilde
b. Plant glabrescent, or (partly) pubescent 9
9a. Androphore much shorter than the synandrium. [Flowers not known in *M. frugifera* and *M. laevis*.] 10
b. Androphore (in mature flower at anthesis) almost as long as synandrium .. 16
10a. Plant stout, the twigs towards apex 4–8 mm diam. Mature male perianth 5–7 mm long; androecium (synandrium) rather cylindrical, 3–5 mm long, androphore pubescent at base 11
b. Plant less stout, twigs towards apex up to 5 mm diam. Mature male perianth 3–4(–4.5) mm long; androecium short, often ± club-shaped or ellipsoid, or ellipsoid-oblong, 1.5–3(–3.5) mm long 12
11a. Leaves generally drying blackish; tomentum of lower leaf surface minute, the hairs ± interwoven, sometimes glabrescent. *Malay Peninsula, Sumatra, Borneo* ..... **M. maxima** Warb.
b. Leaves drying ± olivaceous; tomentum of lower leaf surface with minute scattered hairs. [Male flowers not known.] *Philippines* . **M. frugifera** W. J. de Wilde
12a. Twigs and inflorescences often drying yellowish, leaves greenish yellow or olivaceous. Male perianth splitting at anthesis to c. 1/2(–2/3). Androecium ± ellipsoid, androphore pubescent. [Fruit with persistent scurfy short tomentum.] *Borneo* ..... **M. borneensis** Warb.
b. Twigs and inflorescences drying brownish, leaves drying olivaceous-brown or brown 13
13a. Androecium cylindrical or ellipsoid, the androphore pubescent. Male inflorescences 3–6 cm long. *Philippines (incl. Palawan)* 14
b. Androecium ± club-shaped, the androphore glabrous. Male inflorescences more than 6 cm long 15

14a. Midrib and lateral nerves on lower leaf surface yellowish. [Fruit grey-brown.] *Philippines (excl. Palawan)* ..... **M. agusanensis** Elmer
b. Midrib and lateral nerves on lower leaf surface dark purplish or reddish, contrasting with greyish leaf undersurface. [Fruit with rusty or orange-brown tomentum.] *Philippines: Palawan, Mindoro* ... **M. rubrinervis** W.J. de Wilde
15a. Male inflorescences 7–10 cm long; male perianth 3–3.5 mm long, split at anthesis for 1/4–1/3; androecium without sterile apex, androphore short or absent. [Fruit glabrous or largely so.] *Malay Peninsula, Sumatra, Borneo* .... **M. malaccensis** Hook. f.
b. Male inflorescences 10–15 cm long; male perianth 4(–4.5) mm long, cleft at anthesis to nearly 2/3; sterile apex of androecium bluntish, 0.2–0.3 mm; androphore distinct. [Fruit scurfy.] *Borneo* ..... **M. extensa** W.J. de Wilde
16a. Mature male perianth 7–8 mm long. Leaves beneath papillose, seemingly glabrous, but actually with scattered minute scale-like hairs less than 0.1 mm long (lens!). Male inflorescences usually simple, unbranched, with the flowers fascicled into a short stalked subumbel. [Fruit subglobose or broadly ovoid, 3–4.5 cm long, with persistent scurf of hairs 0.1 mm or less.] An inland species of *C and E Java* (Compare also *M. crassa*) ..... **M. teijsmannii** Miq.
b. Male perianth c. 7 mm long or less. Leaves glabrous (early glabrescent) beneath 17
17a. Twigs towards apex 1.5–3(–3.5) mm diam. Lateral nerves above usually sunken, but distinct. Peduncle of male inflorescences 2–40 mm long, the central branch usually present. Male perianth various in size, 4–6(–7) mm long, pubescent or glabrescent. [Fruit various, 3.5–8.5 cm long.] 18
b. Twigs slender, towards apex 1–2 mm diam. Leaves with lateral nerves indistinct above, lower surface papillose. Male inflorescences almost unbranched, umbel-like, peduncle 4–10 mm. Male perianth c. 5 mm long, glabrescent. [Fruit 3.5–4 cm long.] *Philippines: Palawan* ..... **M. umbellata** Elmer
18a. Leaves generally rather large, (15–)20–35 cm, drying dull greyish (olivaceous-) brown, not papillose beneath. Lateral nerves beneath flat or but slightly raised. Mature male perianth in bud c. 5 mm long; androecium 3–3.5 mm long, androphore glabrous. [Fruit 5.5–8.5 cm long, pericarp (5–)10–15 mm thick.] *Malay Peninsula* ..... **M. wyatt-smithii** Airy Shaw
b. Leaves generally smaller, 7–24 cm, drying olivaceous, not particularly dull-greyish. Lateral nerves usually raised beneath. Androphore pubescent 19
19a. Leaves not papillose below, apex acute-acuminate. Male perianth 4–6(–7) mm long, usually (late) glabrescent; androecium 3–6 mm long. [Fruit 3–6(–8) cm long, pericarp 3–10 mm thick.] *Thailand to Borneo* 20
b. Leaves papillose below, apex blunt to acute (in leaves of sterile sapling shoots acute-acuminate). Male perianth 4–4.5 mm, with persistent tomentum; androecium c. 3.5 mm long. [Fruit 5–8 cm long, pericarp 15–20 mm thick.] *Malay Peninsula, Sumatra, Borneo* ..... **M. gigantea** King
20a. Leaves membranous or chartaceous, or subcoriaceous, 7–24 cm long. Peduncle of female inflorescences and infructescences to 1 cm long. Fruit 4–6(–8) cm long, (dry) pericarp 4–10 cm thick, late or early glabrescent. Male perianth 4–6(–7) mm long. *SE Asia, W Malesia* ..... **M. iners** Blume

b. Leaves thinly membranous, 7–14 cm long. Peduncle of female inflorescences and infructescences slender, 1–2.5 cm long. Fruit 3–4 cm long, early glabrescent; dry pericarp 3–4 mm thick. Male perianth c. 3 mm. *Borneo* ..... **M. fallax** Warb.

21a. Twigs towards the apex slender, 1.5–2(–2.5) mm diam. Leaves of fertile twigs small, 7–12(–15) cm long, top subacute to blunt or rounded; lateral nerves 10–15(–18) pairs. Male perianth 4–4.5 mm long; synandrium without sterile apex. [Fruit 5–8 cm long, late glabrescent from scurfy tomentum with hairs 0.2–0.3 mm.] *Malay Peninsula, Sumatra, Borneo* ..... **M. gigantea** King

b. Twigs towards apex generally thicker; leaves generally larger, the top acute-acuminate, lateral nerves 13–18 pairs, or more. Synandrium usually with small sterile apex. [Fruit pubescent or glabrescent, the tomentum with hairs c. 0.2 mm long or more.] 22

22a. Diameter of twigs towards the apex (1.5–)2–4 mm. Leaves membranous to thinly coriaceous. Mature male perianth 4–7 mm long; sterile apex of the synandrium present, acutish or bluntish, entire. [Fruit glabrous or early glabrescent.] 23

b. Twigs stoutish or stout, towards the apex 3–6 mm diam. Leaves chartaceous or coriaceous. [Fruit glabrous or with persistent tomentum, rarely late glabrescent.] 24

23a. Twigs 1.5–3 mm diam. Leaves usually membranous, the lower surface not papillose. Male perianth 4–6(–7) mm long. [Fruit (3.5–)4–6(–8) cm.] Stout form; mainly from *NE Borneo* ..... **M. iners** Blume

b. Twigs towards apex (2–)2.5–4 mm diam. Leaves chartaceous to thinly coriaceous, beneath distinctly papillose. Mature male perianth 6–7 mm long. [Fruit 7–9 cm, glabrescent, at first with scurfy tomentum with hairs c. 0.5 mm long.] *Peninsular Thailand, Malay Peninsula, doubtful in Sumatra* ..... **M. maingayi** Hook. f.

24a. Leaves coriaceous, papillose beneath. Flowers pubescent with hairs 0.5–1 mm long; mature male perianth 4–4.5 mm long; sterile apex of synandrium usually ± lobed. [Fruit with conspicuous shaggy tomentum with hairs 1–2 mm.] *Malay Peninsula, Sumatra, Borneo* ..... **M. lowiana** King

b. Leaves chartaceous or coriaceous. Tomentum of flowers with hairs 0.3–0.5 mm; male perianth 5 mm long or more; sterile apex of synandrium not lobed. [Fruit glabrous or with scurfy tomentum with hairs c. 0.5 mm.] 25

25a. Mature male perianth 5–5.5 mm long. Bark of twigs early cracking.Leaves not papillose beneath. [Fruit glabrous (early glabrescent).] *Borneo* ..... **M. corticata** W. J. de Wilde

b. Male perianth (5–)6–8 mm long. Bark of twigs late cracking. [Fruit with scurfy tomentum or late glabrescent.] *Philippines* ..... **M. philippensis** Lam.

26a. Twigs stout, towards the apex (4–)5–8 mm diam. Leaves large, 16–40 cm long; lateral nerves 23–33 pairs. Lower leaf surface with persistent tomentum or glabrescent; hairs ± scattered, minute, scale-like, c. 0.1(–0.2) mm or less. Male inflorescences stout, 6–12(–18) cm long. [Dry fruit 6–9 cm long, with scurfy tomentum of hairs 0.1 mm or less, sometimes late-glabrescent.) *Malay Peninsula, Sumatra, Borneo* ..... **M. maxima** Warb.

b. Twigs generally more slender; leaves generally smaller with less pairs of lateral nerves. Male inflorescences shorter. [Fruit of various sizes.] 27

27a. Leaf bud and young twig apex with tomentum with hairs c. 0.1 mm long. Lower leaf surface densely pubescent with scale-like hairs c. 0.1(–0.2) mm (old leaves sometimes glabrescent). Male perianth rather cylindrical or slightly contracted in the middle; apical part of perianth in bud mostly angular, but not winged; sterile apex of synandrium bluntish or subacute, usually fine pubescent (glabrous in Sumatra). [Fruit 5–9 cm long, minutely scurfy.] *Malay Peninsula to Philippines* ..... **M. cinnamomea** King

b. Tomentum of leaf bud, twig apex, and lower leaf surface short or long, with hairs c. 0.1 mm or much longer. Male perianth ± ellipsoid, towards apex not angular along the valve sutures. Sterile apex of synandrium absent, top of synandrium flattish or hollowed, the excavation ± concealed by the somewhat incurved apices of the anthers or not 28

28a. Twigs slender, towards the apex 1.5–3 mm diam. Tomentum of leaf bud and twig apex largely composed of hairs c. 0.1 mm. Male perianth 3–4 mm long; androecium 1.5–2.5 mm long; anthers 6–8(–10). [Fruit with tomentum with hairs c. 0.1 mm or less, sometimes glabrescent.] Not generally a coastal species 29

b. Tomentum of leaf bud and twig apex conspicuous, composed of hairs (0.1–) 0.2–0.5(–1) mm long. Twigs stouter, male perianth larger, androecium larger, anthers 8–12. [Fruit 2.5–4.5 cm long, generally with more conspicuous persistent tomentum with hairs 0.5–1(–2) mm long.] 31

29a. Androecium c. 1.5 mm long. Lateral nerves of leaves rather patent. [Fruit 5–7 cm long, with dense scurfy tomentum.] *Malay Peninsula, Sumatra, Borneo* .. .. **M. depressa** W.J. de Wilde

b. Androecium c. 2.5 mm long. Lateral nerves at an angle with the midrib of c. 45° or less. *Philippines* 30

30a. Midrib and nerves on lower leaf surface grey-brown or brown. [Fruit dull grey brown, 3–4.7 cm long, minutely scurfy, sometimes partly glabrescent.] *Philippines (excl. Palawan)* ..... **M. agusanensis** Elmer

b. Midrib and nerves purplish or reddish brown, much contrasting with the grey-brown lower leaf surface. [Fruit 3–7 cm long, with short dark rusty or orange-brown tomentum, sometimes partly glabrescent in var. *duplex*.) *Philippines: Palawan, Mindoro* ..... **M. rubrinervis** W.J. de Wilde

31a. Not a coastal species. *Yunnan* (no material seen), possibly *N Thailand* .... **M. yunnanensis** Y.H. Li

b. Generally a coastal species. *Burma, east to Bali and the Philippines* .... **M. guatteriifolia** A.DC.

32a. Male perianth ± elongate and towards the top markedly angular; the top (sub)-acute 33

b. Male perianth not angular, top rounded 34

33a. Male perianth ovoid-oblong, (4.5–)5–7 mm long, with hairs c. 0.1 mm. Leaves beneath grey-brown with contrasting bright brown nerves, not or but indistinctly papillose. *Philippines* ..... **M. cumingii** Warb.

b. Male perianth elliptic-oblong, 4.5–8 mm long, with hairs (0.1–)0.2–0.5 mm. Leaves beneath dull, sometimes whitish partly caused by papillae. *W Sarawak, NE Kalimantan, Sulawesi, Sulu Is., Philippines, Sula Is., Bacan I.* ..... **M. simiarum** A.DC.

34a. Male perianth more than 5 mm long (5–11 mm long) 35

b. Male perianth small, 3–4.5(–5) mm long, rough-pubescent. Nerves on upper leaf surface flat or distinctly impressed 38

35a. Male perianth either glabrous, or early glabrescent, or short-haired. Nerves few or many pairs, above flat or but little impressed 36

b. Male perianth conspicuously pubescent. Leaves large, 25–45 cm long, lateral nerves 25–30 pairs, impressed above; lower surface papillose. Bark of twigs longitudinally cracking. *N Moluccas: Bacan I.* .. **M. fissurata** W.J. de Wilde

36a. Leaves lanceolate; lateral nerves 20–30 pairs, very faint beneath; papillae distinct. Male perianth coriaceous; androecium (synandrium) sessile. *Philippines* ..... **M. laevis** W.J. de Wilde

b. Leaves elliptic-oblong, lateral nerves 6–12(–15) pairs, distinct (raised) beneath. Male perianth chartaceous; androecium with a long androphore. *Moluccas* (or cultivated) 37

37a. Male pedicel stoutish, more than 1 mm thick. Flowers thinly pubescent. Leaves subcoriaceous, 9–22 cm long, beneath late glabrescent, at first with minute tomentum; papillae sometimes apparent. Twigs stoutish, towards the apex 2–3.5 mm diam. *N Moluccas* ..... **M. succedanea** Blume

b. Male pedicel slender, less than 1 mm thick. Flowers glabrescent, at first with minute tomentum. Leaves chartaceous, 6–13 cm long, early glabrescent; papillae not apparent. Twigs slender, towards apex 1–2 mm diam. Orig. *Banda I. (Moluccas)*; known only from cultivated specimens ..... **M. fragrans** Houtt.

38a. Leaves membranous, whitish beneath; papillae not apparent. *Sulawesi* ..... **M. impressinervia** J. Sinclair

b. Leaves chartaceous, pale brownish beneath, papillose. *Moluccas, New Guinea: Vogelkop Peninsula* ..... **M. bifurcata** (J. Sinclair) W.J. de Wilde

39a. Male perianth elongate, long, (10–)13–15 mm long 40

b. Male perianth less than 10 mm long 41

40a. Twigs ridged or winged, myrmecophilous. *Kai Is., Aru Is. (& New Guinea)* .. .. **M. subalulata** Miq.

b. Twigs not winged. *Moluccas: Halmaheira, Obi I.* **M. pubicarpa** W.J. de Wilde

41a. Tomentum of most parts, e.g. leaf bud, twig apex, lower leaf surface (partly glabrescent in old leaves), flowers, with conspicuously long hairs, 1–3 mm long. Twigs stoutish, with bark blackish, longitudinally cracked and usually coarsely flaking. [Fruit 4–6(–7) cm long with hispid tomentum with hairs 2–3 (–4) mm long.] *Borneo* ..... **M. villosa** Warb.

b. Hairs shorter, very short or up to 1 mm long, or tomentum (almost) absent 42

42a. Twigs stout, at apex [3(in Malaya)]–4–7(–10) mm diam. 43

b. Twigs generally less stout, slender or of moderate thickness, towards the apex 1–4(–5) mm diam. (4–5 mm diam. in part of the material of *M. beccarii, M. fatua, M. nivea*). Leaves generally smaller (but leaves large in *M. nivea*). *Plant not from Malay Peninsula, Sumatra* 51

43a. Leaves medium, rather narrow, 11–24(–30) cm long, coriaceous. *NE Luzon* ..... **M. colinridsdalei** W. J. de Wilde
b. Leaves generally larger, comparatively broader, (15–)17–40 cm long, membranous or chartaceous 44
44a. Lower leaf surface early glabrescent or with tomentum with scattered (not contiguous, nor interwoven) minute scale-like hairs less than 0.1 mm (lens!) .. 45
b. Lower leaf surface densely tomentose (hairs may be very minute), not or not evidently papillose 47
45a. Lower leaf surface distinctly papillose (lens!). Male perianth 4.5–6 mm long (female perianth in *FRI 11847* 7–8 mm long). [Fruit 3.5–5.5 cm long, with scurfy tomentum with hairs c. 0.1 mm.] *W Malesia: Malay Peninsula, Sumatra, Borneo*; inflorescences possibly rather a much reduced form of the paniculate-type, and hence species close to *M. teijsmannii* from Java .... **M. crassa** King
b. Lower leaf surface not or not evidently papillose 46
46a. Male perianth 8–8.5 mm long. [Fruit not known.] Twigs very stout; leaf blade large, nerves distinct. *N Moluccas: Bacan I.* ..... **M. robusta** W. J. de Wilde
b. Male flowers not known. [Fruit globose, c. 5 cm diam.] Twigs more slender; leaf blade medium, coriaceous, nerves indistinct. *C Sulawesi* .... **M. devogelii** W. J. de Wilde
47a. Tomentum of lower leaf surface with pale scale-like hairs c. 0.1 mm only, the leaves appearing as if glabrous. [Fruit c. 6 cm long, with rusty tomentum with hairs 0.5–1 mm long.] *Philippines* ..... **M. wenzelii** Merr.
b. Tomentum conspicuous, brownish, with hairs 0.2–1 mm long 48
48a. Tomentum of lower leaf surface with hairs 0.3–0.5(–1) mm. [Fruit c. 6 cm, when fresh 7–10.5 cm, with tomentum with hairs 1–1.5 mm.] Stilt roots present. *S India* ..... **M. magnifica** Bedd.
b. Tomentum with hairs 0.2–0.3(–0.4) mm. *Borneo, E Malesia* 49
49a. Male flowers pedicelled 50
b. Flowers sessile. [Fruit 2.5–3.5 cm long, with shaggy tomentum with hairs 1–1.5 mm.] *Lesser Sunda Islands* ..... **M. sumbawana** Warb.
50a. Male perianth c. 6 mm long. [Fruit 5.5–8.5 cm long, pericarp (dry) 10–15 mm thick, with scurfy tomentum with hairs 0.1–0.2 mm.] *N Moluccas* .... **M. sangowoensis** (J. Sinclair) W. J. de Wilde
b. Male perianth 4–6 mm long. [Fruit 4–7 cm long, pericarp with tomentum with hairs 0.5–1 mm long.] *Sulawesi, Moluccas, Philippines (Mindanao)*, and a deviating specimen with male flowers from limestone in *SE Kalimantan* .... **M. fatua** Houtt.
51a. Lower surface of mature leaves glabrous or early glabrescent or with minute scattered (not densely set) hairs 52
b. Lower leaf surface densely pubescent; hairs may be small and scale-like, but densely set or interwoven (lens!) 73
52a. Petiole proportionally long; leaf blade 10–15 cm long, petiole 20–35 mm long. [Male inflorescences and male flowers not known.] *Philippines* .... **M. longepetiolata** W. J. de Wilde
b. Petiole proportionally shorter 53

53a. Androphore (in mature flowers) about as long as the synandrium. *India, Sri Lanka* (but see alternative lead) 54
b. Androphore either 1) about as long as the synandrium (in a few species, e.g. *M. alba, M. cacayanensis, M. lancifolia, M. pilosigemma,* from *outside India or Sri Lanka*) or 2) distinctly shorter (c. 2/3 or less) than the synandrium, in one species from *Sri Lanka* (*M. dactyloides*) or species from *Malesia, Australia* 55

54a. Lower leaf surface generally whitish or glaucous (possibly due to papillae) (not so in *M. beddomei* subsp. *sphaerocarpa*). Tomentum of flowers with hairs (0.2–)0.3–0.5 mm, hairs longest towards the apex; male pedicel generally about as long as the perianth (flowers not known in *M. beddomei* subsp.*sphaerocarpa*). Aril in mature fruit red or yellow. *S India* ..... **M. beddomei** King
b. Lower leaf surface pale brownish, papillae absent or inconspicuous. Tomentum with hairs 0.1–0.2(–0.3) mm long; male pedicel about as long as the perianth. *Sri Lanka* (a rare and insufficiently known species of drier areas) .... **M. ceylanica** A.DC.

55a. Aril in mature fruit yellow. Mature male pedicel shorter than the perianth. Tomentum of perianth with hairs 0.1–0.2 mm. Wet forests of *Sri Lanka* .... **M. dactyloides** Gaertn.
b. Aril red (allways?). Pedicel of male flowers long or short. *Species not from India or Sri Lanka* 56

56a. Leaves small, elliptic-oblong, thinly coriaceous, (2.5–)4–7.5 cm long; lateral nerves faint. Flowers not known. [Fruit ovoid-ellipsoid, 2–2.5 cm long, pericarp 1–2 mm thick, with dense scurfy tomentum with hairs 0.1 mm or less.] *C Sulawesi* ..... **M. ultrabasica** W.J. de Wilde
b. Leaves larger 57

57a. Male perianth ± cylindrical, i.e. parallel-sided, narrow; androphore about as long as the synandrium 58
b. Male perianth proportionally broader, ± ovoid or ellipsoid, or ellipsoid-oblong; androphore about as long as or distinctly shorter than the synandrium; androphore mostly pubescent, at least at base. Lateral nerves not particularly closely set 60

58a. Androphore glabrous. Lateral nerves comparatively closely set. *E Malesia* . 59
b. Androphore densely pubescent; male perianth small, 3.5–4 mm long. Leaves pale beneath, lateral nerves not particularly closely set. *Moluccas* .... **M. alba** W.J. de Wilde

59a. Leaves membranous; tertiary venation distinct beneath. Male perianth 2.5–3 mm long. [Fruit 2.2–3.6 cm long, minutely scurfy.] *NE Moluccas, W New Guinea: Vogelkop Peninsula* .... **M. lepidota** Blume subsp. **montanoides** (Warb.) W.J. de Wilde
b. Leaves chartaceous; tertiary venation faint beneath. Male perianth 4–6 mm long. [Fruit 1.5–2.5(–3) cm long, minutely scurfy.] *Moluccas, W New Guinea* ... . **M. lancifolia** Poir.

60a. Lower leaf surface generally considerably pale, i.e. grey-whitish or glaucous; glabrescent, at first with thin tomentum of which the stouter hairs usually leave

a scattered punctation of minute dark-coloured point-like dots (lens!). *E Malesia* 61

b. Leaves generally more concolorous at both surfaces; if whitish below, than not punctate. Mainly *E Malesia*, and also *Australia* 63

61a. Plant stoutish; leaves large, 20–40 cm long. Male perianth 5–6 mm long. *N Moluccas, Philippines: Mindanao* ..... **M. nivea** Merr.

b. Plant less stout; leaves smaller, up to 25 cm long. Male perianth 4(–5) mm long (only known in *M. impressa, M. pilosigemma*) 62

62a. Tomentum of sterile terminal leaf bud with hairs c. 1 mm long. *Philippines* .. .. **M. pilosigemma** W.J. de Wilde

b. Tomentum shorter. Three species from *Sulawesi*: for distinction see the regional keys for female flowering and fruiting specimens .... **M. impressa** Warb., **M. kjellbergii** W.J. de Wilde, **M. koordersii** Warb.

63a. Male perianth more than 3 mm long 64

b. Male perianth c. 2.5 mm long. *N Moluccas* .... **M. bifurcata** (J. Sinclair) W.J. de Wilde subsp. **sulaica** W.J. de Wilde

64a. Male perianth in apical portion ± angular in cross section. *Philippines* .... **M. cumingii** Warb.

b. Male perianth not angular 65

65a. Twigs stoutish, towards the apex diam. 2–2.5 mm or more (but see also lead 42) 66

b. Twigs generally more slender, towards the apex 1–2(–2.5) mm diam. *Moluccas, W New Guinea, Australia* 69

66a. Male flowers unknown but likely (as judged from the sessile female flowers) with short pedicel. *Lesser Sunda Islands* .... **M. rumphii** (Blume) Kosterm.

b. Pedicel of male flowers about as long as the perianth 67

67a. Leaves coriaceous. *S Taiwan, Philippines: N Luzon*; mainly a coastal species ..... **M. cacayanensis** Merr.

b. Leaves ± chartaceous 68

68a. Inflorescences much appearing as of the *Knema*-type, but possibly to be regarded as essentially of the paniculate-type. Fruit 4.5–6.5 cm long, powdery pubescent with hairs c. 0.1 mm, or partly glabrescent. *Andaman and Nicobar Islands* ..... **M. andamanica** Hook. f.

b. Fruit 2.5–4.5 cm long, with tomentum with hairs 0.1–0.2 mm, sometimes partly glabrescent. *Moluccas, Philippines: Mindanao* .... **M. mindanaensis** Warb.

69a. Tomentum of perianth with hairs c. 0.1 mm. Male flower pedicel about as long as the perianth 70

b. Tomentum with hairs longer, 0.2–0.5 mm long. Male flower pedicel usually shorter than the perianth 71

70a. Upper and lower leaf surface ± concolorous; lower leaf surface not papillose, tertiary venation (reticulation) indistinct. Bracteole persistent. [Fruit subglobose, 2.5–3 cm, pericarp 4–8 mm thick, with tomentum with hairs c. 0.1 mm.] *Moluccas, W New Guinea* ..... **M. tristis** Warb.

b. Leaves pale brown beneath, papillose (but see lead 60); tertiary venation usually contrasting. Bracteole caducous. [Fruit ellipsoid, 2–3 cm long, pericarp c. 2 mm thick, with dark rusty tomentum with hairs 0.3–0.5(–0.8) mm.] *Australia: NE Queensland* ..... **M. muelleri** Warb.

71a. Male perianth at anthesis split to c. 1/3 to nearly 1/2. Inflorescences usually distinctly peduncled. *N Moluccas, W New Guinea: Vogelkop Peninsula* .... **M. bifurcata** (J. Sinclair) W. J. de Wilde subsp. **bifurcata**

b. Male perianth split to c. 1/4. Inflorescences all sessile 72

72a. Leaves to c. 20 cm long, elliptic-oblong to oblong-lanceolate; index c. 2.5 or more. [Fruit 2.5–3.5(–3.8) cm long.] *SE Moluccas (Tanimbar Is.), S New Guinea, N Australia* ..... **M. insipida** R. Br.

b. Leaves 11–25 cm long, elliptic or elliptic-oblong; index 2.5 or less. [Fruit 3.5–4 cm long.] *Australia: Queensland, Clump Point area* .... **M. ampliata** W. J. de Wilde

73a. Tomentum of leaf bud (terminal bud) and apex of young twigs absent or glabrescent, at first with minute greyish hairs; tomentum of lower leaf surface with minute grey-silvery scale-like hairs less than 0.1 mm long. [Fruit 4.5–6.5 cm, ± glabrescent or with scurfy tomentum with minute hairs c. 0.1 mm.] *Andaman and Nicobar Islands* ..... **M. andamanica** Hook. f.

b. Tomentum more conspicuous, cinnamon or pale rufous, with hairs c. (0.1–) 0.2 mm long or more 74

74a. Twigs stoutish, towards the apex (2.5–)4–5 mm diam., the bark lower down with lenticels. Leaves large, c. 20 cm long or more, membranous or chartaceous. *E Malesia* 75

b. Twigs slender, or if stoutish than without lenticels. Leaves to 20(–25) cm long. *W or E Malesia* 76

75a. Male flowers pedicelled. [Fruit 4–7 cm long, with tomentum with hairs 0.5–1 mm.] *Philippines (Mindanao), Sulawesi, Moluccas* **M. fatua** Houtt.

b. Flowers subsessile. [Fruit 2.5–3.5 cm long, with shaggy tomentum with hairs 1–1.5 mm long.] *Lesser Sunda Islands* ..... **M. sumbawana** Warb.

76a. Twigs slender, towards the apex 1–2 mm diameter. Male perianth 2–2.5 mm long. *E Malesia (SW New Guinea, Aru Islands)* .... **M. lepidota** Blume subsp. **lepidota**

b. Twigs stouter 77

77a. Twigs towards apex 2–3 mm diameter. Leaves thinly coriaceous, base rounded or short-acute, nerves not distinct above (like in *M. cinnamomea*). Male flowers insufficiently known. [Fruit 2.5–3.5 cm long, with scurfy tomentum with hairs c. 0.2–0.5 mm.] *Borneo* ..... **M. smythiesii** J. Sinclair

b. Twigs 3–4(–5) mm diameter. Leaves coriaceous, at the base rounded or emarginate, or sometimes short-acute; nerves above sunken but distinct. Male flowers with a conspicuous collar of hairs at the base of the androecium; sterile apex of the androecium minutely pubescent. [Fruit 2.5–3.5 cm long, with woolly tomentum with hairs 0.5–1 mm long.] *Sumatra, Borneo* .... **M. beccarii** Warb.

REGIONAL KEY FOR CONTINENTAL SOUTHEAST ASIA

(India, Sri Lanka, Indochina, S China, Taiwan, excl. the Malay Peninsula and Singapore)

(Key to female flowering and fruiting specimens, using mainly vegetative and fruit characters)

Note: species also occurring in the keys for Malesia have been marked with an *.

1a. Leaves with persistent dense tomentum beneath. Fruit with coarse tomentum with hairs 0.5–1(–2) mm 2
b. Lower leaf surface glabrous or glabrescent, or seemingly glabrous due to the presence of but very minute hairs c. 0.1 mm or less only (tomentum may be dense or consisting of scattered or spaced hairs) 4
2a. Fruit (when dry) 4.5–5.5 cm long. Inflorescences (preferably to be seen in male plants) of the *Knema*-type (i.e. sessile or subsessile short-shoots of longer duration). *India* ..... **M. magnifica** Bedd.
b. Fruit 2.5–5.5 cm long. Inflorescences paniculate, i.e. ramified and with flattened smooth (not scar-covered) main peduncle, the whole inflorescence lasting but one or a few flowering season(s)..... 3
3a. Fruit 4.5–5.5(–6.5) cm long. *S China (Yunnan,* no material seen, possibly *N Thailand* ..... **M. yunnanensis** Y.H. Li
b. Fruit (when dry) 2.5–4(–4.5) cm. *Burma, Indochina* ***M. guatteriifolia** A.DC.
4a. Fruit with coarse tomentum, with hairs c. 1 mm long. Inflorescences (preferably to be seen in male plants) paniculate. *India* ..... **M. malabarica** Lam.
b. Fruit glabrous or with scurfy tomentum with hairs 0.1–0.5 mm long 5
5a. Lower leaf surface generally with a dense, very short tomentum, with scale-like hairs c. 0.1 mm or less (leaves in some collections glabrous). Fruit with scurfy tomentum with hairs c. 0.1 mm. *Andaman & Nicobar Islands* .... **M. andamanica** Hook. f.
b. Lower leaf surface either glabrous (early glabrescent) or with scattered or spaced minute hairs only..... 6
6a. Inflorescences (preferably to be seen in male specimens) of the paniculate type. Fruit glabrous or early or late glabrescent..... 7
b. (Male) inflorescences of the *Knema*-type (appearing as such in most *M. crassa* specimens). Fruit with short scurfy tomentum 10
7a. Fruit 1.5–2.5 cm diam. Lower leaf surface with remotely scattered appressed minute hairs. *Taiwan: Botel Tobago I.*, no specimens seen .... ***M. simiarum** A.DC.
b. Fruit larger. Lower leaf surface glabrous or glabrescent, or almost so 8
8a. Terminal leaf bud with conspicuous tomentum with hairs 0.5–1(–1.5) mm long. *S Peninsular Thailand* ..... ***M. maingayi** Hook. f.
b. Leaf bud with inconspicuous tomentum with small hairs 0.1–0.3 mm only.. 9
9a. Fruit rather ellipsoid, drying blackish. Stem and leaves generally drying yellowish, lower leaf surface often ± papillose. Generally from marsh forest. *S Peninsular Thailand* ..... ***M. elliptica** Wall. ex Hook. f. & Thomson
b. Fruit subglobose, drying brown. Leaves drying ± olivaceous or brown, stem ± brown; lower surface not papillose. Mostly from dryland forest. *Indochina* ... . ***M. iners** Blume

10a. Fruit at base without or with indistinct collar-like indurated perianth-scar; pericarp 4–8 mm thick. Leaves (sub)coriaceous, usually with thin inconspicuous arachnoid tomentum, not particularly glaucous beneath; papillae hardly evident. Mature aril red. A coastal species from *Taiwan (Botel Tobago I.), N Philippines* ..... ***M. cacayanensis** Merr.

b. Fruit at base with small but distinct collar-like indurated perianth-scar (always?). Mature aril yellow or red 11

11a. Dry pericarp 4–10 mm thick. Lower leaf surface generally greyish or glaucous, with papillae distinct (absent in subsp. *sphaerocarpa*). Aril red or yellow. *India* ..... **M. beddomei** King

b. Dry pericarp 2–4 mm thick; aril yellow (not known in *M. ceylanica*). Lower leaf surface brownish, without distinct papillae. *Sri Lanka* 12

12a. Fruit in apical portion rounded, the top with a short acumen when dry. Mature aril yellow. Male pedicel shorter than the perianth. Wetter forests of *SW and C Sri Lanka* ..... **M. dactyloides** Gaertn.

b. Fruit in upper half ± gradually tapered. Colour of aril not known. Male pedicel about as long as the perianth. Dryer forests of *Sri Lanka* .... **M. ceylanica** A.DC.

REGIONAL KEY FOR WEST MALESIA

(Malay Peninsula, Singapore, Andaman and Nicobar Islands, Sumatra, Java, Borneo)
(Key female flowering and fruiting specimens, using mainly vegetative and fruit characters)

1a. Tomentum of sterile terminal leaf bud with minute, usually appressed hairs 0.1–0.2(–0.3) mm long or less; tomentum of other parts, like apex of young twigs, inflorescences, and flowers, generally with similar minute tomentum or glabrescent 2

b. Tomentum composed of more conspicuous hairs, more than 0.2 mm long (if the hairs are much appressed then the tomentum may appear as being shorter) .. 17

2a. Lower leaf surface with persistent or subpersistent dense tomentum (hairs may be very small and hence inconspicuous, but the tomentum is dense, the hairs touching each other, or hairs interwoven; old leaves may be glabrescent). Fruit with scurfy tomentum with hairs c. 0.1 mm 3

b. Lower surface of mature leaves glabrous (early glabrescent) or with very thin tomentum of scattered or sparse (remote, not touching nor interwoven) minute hairs. Tomentum of fruit various, or fruit glabrous 6

3a. Inflorescences (especially as to be seen in male specimens) short, with a short main peduncle, approaching or similar as those of the genus *Knema*, usually unbranched. [Leaves in some specimens glabrous beneath.] *Andaman and Nicobar Islands* ..... **M. andamanica** Hook.f.

b. Inflorescences paniculate, i.e. with common peduncle 4

4a. Perianth in bud (preferably to be seen in male flowers) usually somewhat angular in the upper portion. Twigs slender, towards the apex 1.5–2.5(–4) mm diam. Leaves (8–)10–22 cm long, lateral nerves 10–17 pairs. Fruit (dry) 5–9 cm long, often subsessile ..... **M. cinnamomea** King (check also *M. smythiesii*)

b. Perianth not angular. Twigs stouter, leaves larger, with more pairs of lateral nerves 5

5a. Twigs stout, towards apex (4–)5–8 mm diam.; leaves 16–40 cm long, drying dark brown, lateral nerves (20–)23–33 pairs. Fruit 6–9 cm long ..... **M. maxima** Warb.

b. Twigs towards apex 2–3 mm diam.; leaves 15–30 cm long, drying olivaceous, nerves 16–23 pairs. Fruit 5–7 cm long ..... **M. depressa** W. J. de Wilde

6a. Fruit glabrous or largely or almost completely glabrescent, or fruit inconspicuously pubescent with remote or scattered (not densely set) minute hairs; in glabrescent fruits rarely some minute tomentum remaining in sheltered places near the insertion of the fruit stalk..... 7

b. Fruit with persistent dense-scurfy tomentum, or fruit only partly glabrescent and then always with distinct patches of dense tomentum in sheltered places of the dried fruit, especially towards the insertion of the fruit stalk (hairs may be very small) 13

7a. Twigs and leaves usually drying conspicuously yellowish; lateral nerves 8–13 (–15) pairs. Fruit drying dark brown or blackish, often with greenish-yellowish exudation, 4.5–7.5 cm long, glabrescent, at first with minute tomentum of scattered hairs c. 0.1 mm ..... **M. elliptica** Wall. ex Hook. f. & Thomson

b. Twigs drying yellowish-brown or brown, leaves olivaceous or brown; the lateral nerves 10 pairs or more 8

8a. Marginal arches (as formed by lateral nerves) on lower surface of mature (older) leaves indistinct. Female perianth 4–4.5 mm long (not known in *M. gigantea*) 9

b. Marginal arches beneath (usually) raised and distinct. Female perianth either smaller or larger. Fruit glabrous or glabrescent, but sometimes with remnants of indumentum near insertion of fruit stalk 12

9a. Leaves rather large, (15–)20–35 cm long, drying generally a dull grey-brown; lateral nerves beneath flattish or only slightly raised; papillae absent. Fruit 5.5–9 cm long, drying brown to dark brown, ± glabrescent, at first with hairs c. 0.1 mm, dry pericarp (5–)10–15(–20) mm thick .. **M. wyatt-smithii** Airy Shaw

b. Leaves generally smaller, 7–24 cm long, drying olivaceous-brown; the lateral nerves beneath usually raised. Fruit drying bright brown, glabrescent to largely glabrescent, at first with rather woolly-scurfy tomentum with hairs 0.1–0.3 mm 10

10a. Leaf apex acute-acuminate. Papillae on lower leaf surface absent. Fruit 3.5–6 (–8) cm long, (dry) pericarp 4–10 mm thick 11

b. Apex of leaves of fertile twigs acute or blunt (top of leaves of sterile sapling twigs usually acute or acute-acuminate). Papillae on lower leaf surface distinct. Fruit 5–8 cm long, (dry) pericarp 15–20 mm thick ..... **M. gigantea** King

11a Leaves membranous or chartaceous, or subcoriaceous, 7–24 cm long. Peduncle of female inflorescences and infructescences to 1 cm long. Fruit 4–6(–8) cm long, (dry) pericarp 4–10 mm thick, late or early glabrescent **M. iners** Blume

b. Leaves thinly membranous, 7–14 cm long. Peduncle of female inflorescences and infructescences slender, 1–2.5 cm long. Fruit 3–4 cm long, early glabrescent; dry pericarp 3–4 mm thick. Male perianth c. 3 mm long ..... **M. fallax** Warb.

12a. Twigs towards the apex 2–4 mm diam. Lateral nerves 14–20 pairs. Papillae on lower leaf surface usually not apparent. Female perianth 2–2.5 mm long. Fruit 4–6 cm long ..... **M. malaccensis** Hook. f.
b. Twigs stout, towards the apex 4–8 mm diam. Lateral nerves (16–)20–28 pairs. Papillae on lower leaf surface distinct. Female perianth c. 6 mm long. Fruit 7–9 cm long ..... **M. papyracea** J. Sinclair

13a. Leaves large; nerves 16–30 pairs. Female inflorescences (and fructescences) usually large, paniculate, (1.5–)5–9 cm long (male inflorescences 6–18 cm long). Fruit 6–8 cm long 14
b. Leaves generally smaller; lateral nerves 13–20(–22) pairs; papillae distinct. Female inflorescences (and infructescences) shorter than 5 cm (often sessile) 15

14a. Twigs stout, towards the apex (4–)5–8 mm diam. Leaves: lateral nerves (20–)23–30 pairs; marginal arches ± distinct; papillae usually apparent .... **M. maxima** Warb.
b. Twigs towards the apex 2.5–5 mm diam. Leaves: lateral nerves 16–24 pairs; marginal arches ± indistinct; papillae not apparent . **M. extensa** W. J. de Wilde

15a. Leaves usually drying olivaceous (i.e. greenish), youngest twigs yellowish. Female inflorescences up to 2.5 cm long. Fruit (4.5–)5–7.5 cm long .... **M. borneensis** Warb.
b. Leaves drying olivaceous-brown or brown, twigs (dark) brown. Female inflorescences (sub)sessile 16

16a. Leaves membranous to thinly chartaceous. Female perianth (4–)5–6(–9) mm long; valves c. 0.4 mm thick. Fruit 3–4.5 cm long. [Male flower pedicel 4–6 mm.] *C & E Java*. A species close to *M. crassa* ..... **M. teijsmannii** Miq.
b. Leaves chartaceous to thinly coriaceous. Female perianth 4–5 mm; the valves 0.2–0.3 mm thick. Fruit (3.5–)4–5.5 cm long. [Male pedicel (5–)6–12 mm.] Plant generally stouter than *M. teijsmannii* ..... **M. crassa** King

17a. Twigs stout, towards the apex 5–10 mm diam.; bark usually conspicuously cracking and flaking. Leaf bud and fruit with very conspicuous villous tomentum with hairs (1–)2–3 mm long ..... **M. villosa** Warb.
b. Twigs slender to stoutish, 6 mm diam. or less. Tomentum of leaf bud with hairs c. 1.5 mm long or less 18

18a. Mature leaves pubescent beneath. Fruit 2.5–4.5 cm long 19
b. Lower surface of mature leaves glabrous. Fruit 5 cm long or more 23

19a. Inflorescences (best to be seen in male specimens) paniculate, i.e. ramified and with distinct ± flattened main peduncle, with flowers in subumbels or spikes. Fruit 2.5–4.5 cm long 20
b. Inflorescences of the *Knema*-type (the sessile or subsessile scar-covered short shoots lasting several flowering seasons). Fruit densely pubescent, 2.5–3.5 cm long. Tomentum of leaf bud with hairs up to 0.5(–1) mm. Inland species; not from limestone 21

20a. Twigs stoutish; leaves (12–)15–35 cm long, lateral nerves 15–19(–25) pairs. Tomentum of leaf bud with hairs to 1(–1.5) mm long. Fruit 2.5–4.5 cm long,

densely shaggy pubescent with hairs 0.5–1 mm long. Mainly a coastal species, but sometimes inland in secondary forest ..... **M. guatteriifolia** A.DC.

b. Twigs more slender; leaves smaller, lateral nerves 10–18 pairs. Tomentum of leaf bud with appressed hairs 0.5–1 mm long. Fruit 3.5–4 cm long, glabrescent or with thin tomentum with scattered pale brown appressed hairs up to 0.5 mm. *W Sarawak, NE Kalimantan*; mostly from limestone .... **M. simiarum** A.DC. subsp. **calcarea** W.J. de Wilde

21a. Twigs towards the apex 2–3 mm diam. Leaves thinly coriaceous, base rounded or short-acute; nerves not distinct above. Fruit 2.5–3.5 cm long, with scurfy tomentum with hairs 0.2–0.3(–0.5) mm long ... **M. smythiesii** J. Sinclair

b. Twigs stouter, towards the apex 3–4(–5) mm diam. Leaves coriaceous, base rounded or emarginate, sometimes short-acute; nerves distinct above. Fruit 2.5–3.5 cm long, with woolly hairs 0.5–1 mm 22

22a. Male flowers: androecium ± sessile, with a collar of conspicuous hairs around base, sterile apex ± pubescent ..... **M. beccarii** Warb.

b. Androecium with distinct androphore, sterile apex without hairs. *Kuswata 886*, male fl., from *SE Kalimantan* ..... see under **M. fatua** Houtt. subsp. **fatua**

23a. Fruit glabrous (early glabrescent). Lower leaf surface without papillae, concolorous with upper surface 24

b. Fruit either with persistent tomentum, or late glabrescent, or early glabrescent in *M. gigantea* and *M. maingayi*. Lower leaf surface with papillae evident (lens!), generally paler than upper leaf surface 25

24a. Leaves usually membranous, up to 24 cm long, base usually attenuate. Twigs towards the apex up to 4 mm diam., smooth or striate, the bark of the twigs lower down cracking or not; terminal leaf bud slender. Fruit to 8 cm long, dry pericarp 5–10 mm thick. (Stout forms mainly from *NE Borneo*.) .... **M. iners** Blume

b. Leaves larger, chartaceous, base broadly rounded. Twigs towards the apex (4–)5–6 mm diam., bark early conspicuously cracking; the terminal leaf bud stout. Fruit 7.5–9.5 cm long, dry pericarp 15–20 mm thick. *NE Borneo* .... **M. corticata** W.J. de Wilde

25a. Twigs slender, towards apex 1.5–2.5(–3) mm diam. Leaves (of fertile twigs) small, 7–12(–15) cm long, top acute, or blunt, or rounded; lateral nerves 10–15 (–18) pairs. Fruit 5–8 cm long, (late) glabrescent, at first with scurfy tomentum with hairs c. 0.2 mm ..... **M. gigantea** King

b. Twigs generally stouter, leaves larger, the top acute-acuminate; lateral nerves 13–22 pairs. Hairs of tomentum of fruit larger, c. 0.5 mm long or more .. 26

26a. Diameter of twigs towards the apex (2–)2.5–4 mm. Leaves chartaceous or thinly coriaceous. Fruit 7–9 cm long, glabrescent, at first with rather scurfy tomentum with hairs c. 0.5 mm ..... **M. maingayi** Hook.f.

b. Twigs towards the apex 3–6 mm diam. Leaves coriaceous. Fruit (5–)6–7 cm long, with conspicuous persistent tomentum with shaggy hairs 1–2 mm long .. .. **M. lowiana** King

REGIONAL KEY FOR EAST MALESIA

(Philippines, Sulawesi, Lesser Sunda Islands, Moluccas, W New Guinea partly, Australia; most of New Guinea excepted)

(Key to female flowering and fruiting specimens, using mainly vegetative and fruit characters)

1a. Lower leaf surface with persistent dense tomentum; the hairs may be small but are densely interwoven 2
b. Lower surface of mature (old) leaves glabrous or glabrescent, or with scarce tomentum with either scattered (spaced, not touching or interwoven) hairs, or consisting of a very minute cobweb-like covering only visible with a lens 10
2a. Tomentum of terminal sterile leaf bud conspicuous, with hairs (0.1–)0.5–1 mm long. Fruit (when dry) 2.5–4 cm long, with persistent shaggy tomentum with hairs 0.5–1(–2) mm long. *Burma to Philippines* ... **M. guatteriifolia** A.DC.
b. Tomentum of leaf bud short, with hairs 0.1–0.5 mm 3
3a. Twigs stout, towards the apex (3–)4–8 mm diam. Tomentum of fruit with distinct hairs 0.5–1 mm long, or scurfy 6
b. Twigs slender, towards the apex 1–2.5(–4) mm diam. Leaves small or medium, (5–)8–22 by (1.5–)2–8 cm. Tomentum of fruit scurfy, with hairs 0.1–0.2 mm long 4
4a. Fruit 3–9 cm long. *Philippines* 5
b. Fruit 2.5–3 cm long. *E Moluccas, W New Guinea* ..... **M. lepidota** Blume subsp. **lepidota**
5a. Fruit 5–9 cm long. Tomentum of lower leaf surface persistent. Midrib beneath brown or yellowish. (Recorded by Sinclair for Mindanao, *Ahern 421*, a specimen not seen by me.) ..... **M. cinnamomea** King
b. Fruit 3–7 cm long. Tomentum of lower leaf surface late falling. Midrib beneath purplish, contrasting with the greyish lower leaf surface. *Philippines: Palawan, Mindoro* ..... **M. rubrinervis** W.J. de Wilde
6a. Leaves coriaceous, 11–24(–30) cm long. *Philippines: NE Luzon* ..... **M. colinridsdalei** W.J. de Wilde
b. Leaves membranous or chartaceous, 20 cm long or more 7
7a. Twigs moderately stout. Leaves on lower surface with tomentum with yellowish brown hairs c. 0.1–0.2(–0.5) mm 8
b. Twigs stout, towards the apex 5–8 mm diam. Leaves rather tapered (narrowed) in the lower half, nerves 30–35 pairs; lower surface with whitish dense felty tomentum with hairs c. 0.1 mm or less, appearing as if glabrous (lens!). Fruit 6–6.5 mm long, with conspicuous rusty tomentum of hairs c. 1 mm. *N Moluccas, S Philippines* ..... **M. wenzelii** Merr.
8a. [Male flowers pedicellate.] Fruit 3.5–8.5 cm long 9
b. Flowers sessile. Fruit 2.5–3.5 cm long, with conspicuous rusty tomentum with shaggy hairs (1–)1.5 mm long. *Lesser Sunda Islands: Sumbawa, Flores* ..... **M. sumbawana** Warb.
9a. Fruit 3.5–6.5(–7) cm long, with conspicuous tomentum with rusty hairs 0.5–1 mm. *Philippines, Sulawesi, Moluccas* ..... **M. fatua** Houtt.
b. Fruit 5–8.5 cm long, with dull cinnamon scurfy tomentum with hairs 0.1–0.2 mm. *N Moluccas* ..... **M. sangowoensis** (J. Sinclair) W.J. de Wilde

10a. Twigs distinctly ridged or winged, myrmecophilous. *Kai and Aru Is. (and New Guinea)* ..... **M. subalulata** Miq.
b. Twigs neither ridged nor winged 11
11a. Petiole proportionally long; leaf blade 10–15 cm long, petiole 20–35 mm long. *Philippines* ..... **M. longepetiolata** W. J. de Wilde
b. Petiole proportionally shorter 12
12a. Female perianth in bud acutish, much narrowed towards the top, the apical portion sharp-angular in cross section. Leaves small to medium-sized 13
b. Apex of female perianth narrowed or not, in cross section ± angular or not, but not sharply angular. Leaves either small, or medium, or large and stout. Fruit glabrous (glabrescent) or pubescent, various in size 14
13a. Female perianth 5–6 mm long. Leaves beneath glabrous or subglabrous (with minute scattered hairs), the upper leaf surface sometimes scabrous. Fruit small, (1.5–)2–3.5 cm long, with thin tomentum with scattered hairs 0.3–0.5 mm, or glabrescent. (A species close to *M. elliptica*.) *S Taiwan (Botel Tobago I.), Philippines, Sulawesi, Moluccas* ..... **M. simiarum** A.DC. [subsp. **celebica** (Miq.) W. J. de Wilde & subsp. **simiarum**]
b. Female perianth c. 10 mm long, at anthesis opening for only about 1/8. Leaves beneath with tomentum of fairly dense or scattered scales 0.1–0.2 mm. (Dry) fruit 5–6 cm long, densely dark brown short-pubescent. *N Moluccas* ..... **M. pubicarpa** W. J. de Wilde
14a. Twigs generally stout, towards the apex 3–5(–10) mm diam. Leaves large, to 45 cm long. Fruit large (not known in *M. robusta*), (4–)5–8 cm long, with persistent tomentum 15
b. Twigs stout or slender, 1–5 mm diam. Leaves generally smaller. Fruit small, c. 2–5.5 cm long, or if fruit larger, then glabrous (early glabrescent) 19
15a. Bark of twigs conspicuously longitudinally cracking, ± flaking. Lower leaf surface very distinctly papillose. [Female flowers not known.] *Moluccas: Bacan I.* ..... **M. fissurata** W. J. de Wilde
b. Bark of twigs striate, at most (finely) cracking and finely flaking; papillae on lower leaf surface distinct or not 16
16a. Inflorescences (preferably to be seen in male specimens) essentially of the paniculate type 18
b. Inflorescences of the *Knema*-type. Twigs and leaves stout 17
17a. Twigs and leaves very stout; leaves chartaceous, nerves distinct below. [Fruit not seen.] *Moluccas: Bacan I.* ..... **M. robusta** W. J. de Wilde
b. Twigs and leaves medium; leaves coriaceous, nerves faint. [Male flowers not seen.] *C Sulawesi* ..... **M. devogelii** W. J. de Wilde
18a. Tomentum of terminal leaf bud with hairs 1(–2) mm long. Tomentum of fruit with hairs 0.3–0.5 mm long. *Philippines* ..... **M. philippensis** Lam.
b. Tomentum of terminal leaf bud with hairs 0.1–0.2(–0.3) mm. Fruit with scurfy tomentum with hairs c. 0.1 mm. [Female flowers not seen.] *Philippines* ..... **M. frugifera** W. J. de Wilde
19a. Twigs slender, towards the apex 1–2 mm diam. Fruit 3.5–4 cm long, early glabrescent, at first with minute tomentum. Lower leaf surface distinctly papillose.

Bracteole in female flowers inserted well below the perianth. *Philippines: Palawan* ..... **M. umbellata** Elmer

b. Twigs slender to medium. Fruit pubescent or partly late-glabrescent (tomentum may be very short), or, if glabrous or early glabrescent then fruit large, c. 5 cm or more. Papillae absent or present, distinct or not. Bracteole in female flowers inserted at base of perianth 20

20a. Twigs, leaves and fruit completely glabrous. *Moluccas: Ceram* .... **M. perlaevis** W. J. de Wilde

b. Plants glabrescent or partially with tomentum 21

21a. Lower leaf surface smooth, with the lateral nerves flat or but slightly raised, not to be felt with the finger; papillae (lens!) very distinct. Leaf blade lanceolate, lateral nerves 20–30 pairs. Pericarp thick, c. 10 mm. *Philippines* .... **M. laevis** W. J. de Wilde

b. Leaves elliptic or lanceolate, lateral nerves c. 20 pairs or less, flat(tish) or generally raised beneath. Papillae absent or present, conspicuous or not (lens!) 22

22a. Leaves small, (2.5–)4–7.5 cm long; lateral nerves 10–15 pairs, flat, indistinct or invisible on both surfaces; papillae absent. Fruit ± ellipsoid, 2–2.5 cm long, pericarp 1–2 mm thick, with a tomentum of very short hairs, 0.1 mm or less. *C Sulawesi* ..... **M. ultrabasica** W. J. de Wilde

b. Leaves larger, nerves generally more distinct 23

23a. Nerves rather oblique, at an angle of c. 45° or less with the midrib. Inflorescences (best to be seen in male specimens) essentially paniculate. *Philippines* (but check *M. impressa, M. kjellbergii* and *M. koordersii* from Sulawesi).. 24

b. Nerves generally more patent, at an angle of c. 45° or more with the mibrib. Inflorescences either few-flowered, much reduced, or of the *Knema*-type (flowers at the end of scar-covered wart-like short-shoots lasting several flowering seasons); short peduncle sometimes present 25

24a. Fruit 3–4.7 cm long, with dull greyish brown scurfy tomentum. Midrib on the lower leaf surface yellowish brown or brown when dry. *Philippines* .... **M. agusanensis** Elmer

b. Fruit 3–7 cm long, with bright dark rusty or orange-brown scurfy tomentum. Midrib on lower leaf surface drying dark purplish or reddish, contrasting. *Philippines* ..... **M. rubrinervis** W. J. de Wilde

25a. Fruit glabrous or at first with minute hairs c. 0.1 mm or less, largely early glabrescent. Inflorescences (best to be seen in male specimens) like those of *M. fragrans,* i.e. delicate, few-flowered, without or with a distinct common peduncle. Leaves rather elliptic, few-nerved..... 26

b. Fruit with persistent tomentum (tomentum may be very short and inconspicuous). Inflorescence rather of the *Knema*-type, without or with a short, or with a conspicuous common peduncle, with the flowers in woody scar-covered short-shoots of longer duration 28

26a. Perianth with rough tomentum, with hairs 0.2–0.3 mm long. Male perianth 3.5–4 mm long. [Female flowers and fruit not known.] *C & SE Sulawesi* ... . **M. impressinervia** J. Sinclair

b. Hairs of perianth c. 0.1 mm or less, or perianth glabrescent. Male perianth 7 mm or more. *Moluccas*, or cultivated elsewhere 27

27a. Plant rather stoutish: twigs towards the apex 2–3.5 mm diam.; leaves ± coriaceous, 9–22 cm long, beneath rather late-glabrescent. Fruit (dry) 4.5–8 cm long. *N Moluccas* ..... **M. succedanea** Blume
b. Twigs towards the apex 1–2 mm diam.; leaves chartaceous, 6–13 cm long, beneath early glabrescent. Dry fruit 4–6 cm long. *Cultivated* (originating from *Banda I.*) ..... **M. fragrans** Houtt.
28a. Fruit 3–4 cm long; tomentum of fruit conspicuous, with hairs coarse, (0.5–)1 mm long 29
b. Fruit of various size; the tomentum either mealy or scurfy, or woolly, with hairs shorter, 0.1–0.5(–0.8) mm long 32
29a. Twigs moderately stout, towards apex 2.5–4(–6) mm diam. Female flowers ± sessile. *Lesser Sunda Islands* ..... **M. rumphii** (Blume) Kosterm.
b. Twigs generally less stout. Female flowers (shortly) pedicelled 30
30a. Male inflorescences peduncled. *Moluccas, W New Guinea: Vogelkop Peninsula* ..... **M. bifurcata** (J. Sinclair) W. J. de Wilde
b. Inflorescences (sub)sessile (as in the genus *Knema*) 31
31a. *Philippines* ..... **M. pilosigemma** W. J. de Wilde
b. *Australia* (*M. ampliata, M. insipida*) 47
32a. Colour of lower leaf surface considerably pale, greyish or whitish, lower leaf surface glabrescent, at first with a rather weak tomentum of which the stouter hairs usually leave numerous regularly spaced small dark-coloured point-like scars (lens!); punctation not to be confused with the larger-sized dark-coloured non-traumatic cork warts similar to those found in some species of *Knema, Horsfieldia,* and *Myristica* from New Guinea 33
b. Upper and lower leaf surface generally more concolorous, or if lower leaf surface pale (greyish or whitish), then not finely punctate (lower leaf surface sometimes pale but without dark points in *M. lancifolia* and *M. muelleri*) 38
33a. Plant stoutish; leaves large, 20–40 cm long, grey-whitish beneath. Fruit ellipsoid, 3.5–4 cm long, with tomentum with hairs c. 0.1 mm or less. *N Moluccas: Talaud I., Philippines: Mindanao* ..... **M. nivea** Merr.
b. Plant less stout; leaves smaller, up to 25 cm long, grey-brown or grey-white beneath 34
34a. Sterile terminal leaf bud with hairs c. 1 mm long. *Philippines* ..... **M. pilosigemma** W. J. de Wilde
b. Hairs shorter 35
35a. Fruit short ellipsoid, 3–4.5 cm long, tomentum with hairs 0.1–0.5 mm long; pericarp thick and woody, c. 5 mm thick. *Moluccas* .. **M. alba** W. J. de Wilde
b. Pericarp (when dry) 1–6(–8) mm thick, apparently not hard-woody 36
36a. Female flowers and fruit (sub)sessile. Fruit subglobose, 2–2.5(–3) cm long; dry pericarp 1–3 mm thick; tomentum with hairs 0.1–0.2 mm. *N, C & SW Sulawesi* ..... **M. kjellbergii** W. J. de Wilde
b. Female flowers and fruit stalked. Fruit ± ellipsoid, 3–4 cm long; dry pericarp 3–6(–8) mm thick; hairs c. 0.1 mm long 37
37a. Fruiting pedicel (former female flower pedicel; fruit stalk) to c. 10 mm long, conspicuously pubescent with hairs 1–1.5 mm long. *NE Sulawesi (Minahasa)* ..... **M. koordersii** Warb.

b. Fruiting pedicel (fruit stalk) 5(–7) mm, glabrescent or with hairs up to 0.5 mm long only. *Sulawesi (except Minahasa)* ..... **M. impressa** Warb.

38a. Twigs stoutish, towards the apex 3–4 mm diam., lower down densely set with lenticels. Leaves coriaceous. Fruit subglobose, 3–4 cm long, with tomentum with hairs 0.1–0.2 mm. Mainly a coastal species; *S Taiwan, N Philippines* .. .. **M. cacayanensis** Merr.

b. Twigs generally more slender, towards the apex (1–)1.5–2 mm diam. (2–3 mm diam. in *M. mindanaensis*); lenticels present or ± absent. Leaves membranous or chartaceous 39

39a. Lenticels of twigs few and inconspicuous. Fruit subglobose or ellipsoid, 3.5–5 cm long, the tomentum with hairs c. 0.1 mm. *Philippines* **M. cumingii** Warb.

b. Lenticels present, distinct or not. Fruit generally smaller 40

40a. Leaves rather large, elliptic to oblong-lanceolate, 14–35 cm long. Fruit ellipsoid, (2.5–)3–3.5(–4.5) cm long; tomentum short, with hairs 0.1–0.2 mm. *Moluccas, Philippines: Mindanao* ..... **M. mindanaensis** Warb.

b. Leaves generally smaller, to 20(–25) cm long; if leaves large, then index 2.5 or less. Fruit various 41

41a. Lower leaf surface without papillae (lens!). Fruit subglobose, 2.5–3 cm long; pericarp comparatively thick, 4–8 mm; tomentum with hairs 0.1 mm or less. *N Moluccas, W New Guinea* ..... **M. tristis** Warb.

b. Papillae generally distinct. Fruit ellipsoid; pericarp thinner; tomentum with short or long hairs (0.1–1 mm) 42

42a. Male inflorescences generally distinctly peduncled; male perianth small, 2.5–4 mm long. *Sulawesi, N Moluccas* 43

b. Male inflorescences sessile or subsessile; male perianth small or large, 3–6.5 mm long. *Moluccas, S & W New Guinea, or Australia* 44

43a. [Female flower and fruit not known.] Twigs slender; leaves membranous. Tomentum of (male) perianth with hairs c. 0.3 mm. *Sulawesi* .... **M. impressinervia** J. Sinclair

b. Twigs stouter; leaves chartaceous. Tomentum of perianth with hairs c. 0.1 mm. Fruit ovoid-ellipsoid, 3–4 cm long, with scurfy tomentum with hairs c. 0.2 mm. *N Moluccas* .... **M. bifurcata** (J. Sinclair) W. J. de Wilde subsp. **sulaica** W. J. de Wilde

44a. Leaves membranous; tertiary venation on lower leaf surface distinct. Fruit 2–3.5 cm long, with tomentum with hairs 0.1(–0.2) mm. Male perianth small, c. 3 mm long. *NE Moluccas, W New Guinea: Vogelkop Peninsula* .... **M. lepidota** Blume subsp. **montanoides** (Warb.) W. J. de Wilde

b. Leaves generally rather chartaceous. Male perianth 4–6.5 mm long 45

45a. Tertiary venation on lower leaf surface generally indistinct; nerves 8–20 pairs, rather closely set. Fruit 1.3–2.6(–3) cm long, with tomentum with hairs c. 0.1 mm. *Moluccas, NW New Guinea* ..... **M. lancifolia** Poir.

b. Tertiary venation distinct or not; nerves comparatively wider apart, 6–17 pairs. Tomentum of fruit with hairs 0.3–1 mm long..... 46

46a. Venation on lower leaf surface often darker coloured and contrasting. Fruit 2–3 cm long, with dark rusty tomentum. Rain forest of *NE Queensland* .... **M. muelleri** Warb.

b. Venation on lower leaf surface generally not much contrasting. Tomentum of fruit usually paler, brown or pale (yellowish) brown 47

47a. Fruit 3.5–4 cm long. Leaves 11–25 cm long, comparatively broad, index 2.5 or less. Lowland rain forest in *Clump Point* area, *Queensland* .... **M. ampliata** W. J. de Wilde

b. Fruit 2.5–3.5(–3.8) cm long. Leaves to c. 20 cm long, index c. 2.5 or more. Deciduous and gallery forest, and rain forest. *SE Moluccas (Tanimbar Is.), S New Guinea, N Australia* ..... **M. insipida** R.Br.

ENUMERATION OF THE PARTIAL AREAS AND CONCERNING KEYS

1. INDIA, SRI LANKA — 5 (6) species and 2 subspecies [With partial keys below]

(*M. andamanica*, Andaman & Nicobar Is.)
M. beddomei
subsp. *beddomei*
subsp. ***sphaerocarpa***
subsp. ***ustulata***
M. ceylanica
M. dactyloides
M. magnifica
M. malabarica

Notes — *Myristica beddomei*, *M. ceylanica*, and *M. dactyloides* from S India and Sri Lanka are closely related. They have a small or medium leaf size, glabrous leaves, sessile inflorescences, i.e. wart- or worm-like scar-covered short-shoots, without a common peduncle, as in the genus *Knema*. Within the Indian *M. beddomei* three subspecies are recognized. *Myristica magnifica* can be identified by stout twigs and leaves, the blades with persistent dense tomentum on the lower surface. *Myristica malabarica* is readily distinct by twigs of a tiny habit, with small, glabrous leaves, and slender inflorescences which are distinctly peduncled.

KEY TO SPECIES
(Applicable for male flowering specimens)

1a. Androphore (in mature flowers) about as long as the synandrium. Mature male pedicel (generally) about as long as the perianth 2

b. Androphore distinctly shorter (about 2/3 or less) than the synandrium. Aril in mature fruit yellow. Mature male pedicel shorter than the perianth. Tomentum of perianth with hairs 0.1–0.2 mm. Wet forest of *Sri Lanka* .... **M. dactyloides** Gaertn.

2a. Lower leaf surface generally whitish or glaucous (possibly by the presence of papillae or alveolar material) (not so in *M. beddomei* subsp. *sphaerocarpa*). Tomentum of flowers with hairs (0.2–)0.3–0.5 mm, hairs longest towards apex (flowers not known in *M. beddomei* subsp. *sphaerocarpa*). Aril in mature fruit red or yellow. *India* ..... **M. beddomei** King

b. Lower leaf surface pale brownish, papillae absent or inconspicuous. Tomentum of flowers with hairs 0.1–0.2(–0.3) mm long. *Sri Lanka* (a rare and insufficiently known species of drier areas) ..... **M. ceylanica** A.DC.

KEY TO SPECIES

(Applicable for female flowering and fruiting specimens, using also vegetative characters)

1a. Dry pericarp 4–10 mm thick. Lower leaf surface generally greyish or glaucous, distinctly papillose (not so in subsp. *sphaerocarpa*). Aril red or yellow. *India* .. .. **M. beddomei** King

b. Dry pericarp 2–4 mm thick; aril yellow (not known in *M. ceylanica*). Lower leaf surface brownish, not papillose (lens!). *Sri Lanka* 2

2a. Fruit in apical portion rounded, the top with a short acumen when dry. Mature aril yellow. [Male pedicel shorter than the perianth.] Wetter forests of *SW and C Sri Lanka* ..... **M. dactyloides** Gaertn.

b. Fruit in upper half ± gradually tapered. Colour of aril not known. [Male pedicel about as long as the perianth.] Dryer forests of *Sri Lanka* . **M. ceylanica** A.DC.

2. CONTINENTAL SOUTHEAST ASIA, incl. BURMA, CHINA, VIETNAM, LAOS, CAMBODIA, THAILAND, ANDAMAN & NICOBAR ISLANDS (excl. mainland India, Sri Lanka and the Malay Peninsula) — 8 species

M. andamanica
M. cacayanensis
M. elliptica
M. guatteriifolia
M. iners
M. maingayi
M. simiarum subsp. *simiarum*
M. yunnanensis

3. MALAY PENINSULA and SINGAPORE — 12 species [See Key on p. 135]

M. cinnamomea
M. crassa
M. depressa
M. elliptica
M. gigantea
M. guatteriifolia
M. iners
M. lowiana
M. maingayi
M. malaccensis subsp. *malaccensis*
M. maxima
M. wyatt-smithii

Note — Sinclair (Gard. Bull. Sing. 16, 1958, 333–368; ibid. 23, 1968, 11) had in total 10 species, whereas at present 12 species are recognized: *M. depressa* is newly described and *M. wyatt-smithii*, which was under *M. iners* with Sinclair, is here re-

instated. *Myristica fragrans*, as introduced and cultivated or sometimes quasi-naturalized, is omitted from the list. Sinclair (1958) gives two keys to the species, including *M. fragrans*, one key for fertile material, the other one for sterile material. A general key to the species of the Malay Peninsula, Singapore, Sumatra, and Java is given below.

4. SUMATRA — 12 (13) species [See Key below]

M. beccarii
M. cinnamomea
M. crassa
M. depressa
M. elliptica
M. gigantea
M. guatteriifolia
M. iners
M. lowiana
M. maingayi (?)
M. malaccensis
M. maxima
M. wyatt-smithii (?)

As can be seen from the list, the species assortment of Sumatra is almost similar to that of the Malay Peninsula, with only some discrepancies.

5. JAVA — 3 species [See Key below]

M. guatteriifolia
M. iners
M. teijsmannii

Note — *Myristica fragrans* Houtt., originating from the Moluccas, is widely cultivated, also in Java. According to Backer & Bakhuizen van den Brink, Flora of Java 1 (1963) 139, *M. fatua* Houtt., originating from East Malesia, is occasionally cultivated in Java.

GENERAL KEY TO THE SPECIES OF
THE MALAY PENINSULA, SINGAPORE, SUMATRA, AND JAVA
(Applicable for male- and female-flowering and fruiting specimens, with an emphasis on sterile characters)

1a. Inflorescences sessile, like in the genus *Knema*; common peduncle absent or up to 2 mm long 2
b. Inflorescences peduncled, usually clearly ramified 4
2a. Tomentum of sterile terminal leaf bud with hairs more than 0.2 mm long. Mature leaves short-pubescent beneath. Male flowers: androecium ± sessile, with a collar of conspicuous hairs around the base, sterile apex ± pubescent ..... **M. beccarii** Warb.
b. Tomentum of sterile terminal leaf bud with hairs 0.2 mm or less. Lower leaf surface finely papillate, early glabrescent 3

3a. Leaves membranous or thinly chartaceous. Female perianth (4–)5–6(–9) mm long; valves c. 0.4 mm thick. Fruit 3–4.5 cm long. Male flower pedicel 4–6 mm. A species close to *M. crassa. C & E Java* ..... **M. teijsmannii** Miq.

b. Leaves chartaceous or thinly coriaceous. Female perianth 4–5 mm; valves 0.2–0.3 mm thick. Fruit (3.5–)4–5.5 cm long. Male pedicel (5–)6–12 mm. Plant generally stouter than *M. teijsmannii* ..... **M. crassa** King

4a. Tomentum of sterile terminal leaf bud short, with hairs 0.1–0.2(–0.3) mm long or less 5

b. Tomentum of sterile terminal leaf bud with hairs more than 0.2 mm long ... 13

5a. Lower leaf surface with persistent or subpersistent dense tomentum (hairs may be very small and hence the tomentum inconspicuous, but the tomentum is dense, hairs touching each other, or hairs interwoven; old leaves may be glabrescent). Fruit with scurfy tomentum with hairs c. 0.1 mm 6

b. Lower surface of mature leaves glabrous (early glabrescent) or with very thin tomentum of scattered or sparse (remote, not touching nor interwoven) minute hairs. Tomentum of fruit various, or fruit glabrous 8

6a. Perianth in bud (preferably to be seen in male flowers) usually somewhat angular in the upper portion. Twigs slender, towards the apex 1.5–2.5(–4) mm diam. Leaves (8–)10–22 cm long, lateral nerves 10–17 pairs. Fruit (dry) 5–9 cm long, often subsessile ..... **M. cinnamomea** King

b. Perianth not angular. Twigs stouter, the leaves larger, with more pairs of lateral nerves 7

7a. Twigs stout, towards apex (4–)5–8 diam.; leaves 16–40 cm long, drying dark brown, lateral nerves (20–)23–33 pairs. Fruit 6–9 cm long **M. maxima** Warb.

b. Twigs towards apex 2–3 mm diam.; leaves 15–30 cm long, drying olivaceous, nerves 16–23 pairs. Fruit 5–7 cm long ..... **M. depressa** W. J. de Wilde

8a. Fruit glabrous or largely or almost completely glabrescent, or fruit inconspicuously pubescent with remote or scattered (not densely set) minute hairs; in glabrescent fruits rarely some minute tomentum remaining in sheltered places near the insertion of the fruit stalk. Lateral nerves c. 20 per side, or less 9

b. Fruit with persistent dense-scurfy tomentum, or fruits but partly glabrescent and then always with distinct patches of dense tomentum in sheltered places of the dried fruit, especially towards the insertion of the fruit stalk (hairs may be very small). Leaves large; nerves (20–)23–30 per side; lines of interarching distinct. Inflorescences widely paniculate. Twigs stout. Fruit (4.5–)6–9 cm long. Male perianth 5–7 mm ..... **M. maxima** Warb.

9a. Twigs and leaves usually drying conspicuously yellowish; lateral nerves 8–13 (–15) pairs. Fruit drying dark brown or blackish, often with a greenish yellowish exudation, 4.5–7.5 cm long, glabrescent, at first with minute tomentum with scattered hairs c. 0.1 mm. Perianth angular in apical portion .... **M. elliptica** Wall. ex Hook. f. & Thomson

b. Twigs drying yellowish brown or brown, leaves olivaceous or brown; lateral nerves 10 pairs or more 10

10a. Twigs towards the apex 2–4 mm diam.; lateral nerves 14–20 pairs; lines of interarching on lower leaf surface of mature (older) leaves usually raised and distinct. Papillae on lower leaf surface usually not apparent. Male perianth 3–3.5 mm long. Female perianth 2–2.5 mm long, ovary glabrous. Fruit 4–6 cm long, glabrous ..... **M. malaccensis** Hook. f.

b. Lines of interarching indistinct. Male and female flowers larger (female flowers not known in *M. gigantea*) 11

11a. Leaves rather large, (15–)20–35 cm long, drying generally to a dull grey-brown; lateral nerves beneath flattish or slightly raised; papillae absent. Fruit 5.5–9 cm long, drying brown to dark brown, rather glabrescent, at first with hairs c. 0.1 mm; dry pericarp (5–)10–15(–20) mm thick .. **M. wyatt-smithii** Airy Shaw

b. Leaves generally smaller, 7–24 cm long, drying olivaceous-brown; the lateral nerves beneath usually raised. Fruit drying bright brown, wholly or largely glabrescent, at first with a rather woolly-scurfy tomentum with hairs 0.1–0.3 mm 12

12a. Leaf apex acute-acuminate. Papillation on lower leaf surface absent. Fruit 3.5–6(–8) cm long, (dry) pericarp 4–10 mm thick ..... **M. iners** Blume

b. Apex of leaves of fertile twigs acute or blunt (top of leaves of sterile sapling twigs usually acute or acute-acuminate). Papillation on lower leaf surface distinct. Fruit 5–8 cm long, (dry) pericarp 15–20 mm thick . **M. gigantea** King

13a. Leaves (12–)15–35 cm long, with persistent tomentum beneath; lateral nerves 15–19(–25) pairs. Tomentum of leaf bud with hairs to 1(–1.5) mm long. Fruit 2.5–4.5 cm long, densely shaggy pubescent with hairs 0.5–1 mm long. Mainly a coastal species, but sometimes inland in secondary forest .... **M. guatteriifolia** A.DC.

b. Leaves glabrous (glabrescent) below, papillose; lateral nerves 10–18 pairs. Tomentum of leaf bud with appressed hairs 0.5–1 mm long. Fruit 5 cm long or more, glabrescent or with persistent tomentum 14

14a. Twigs slender, towards apex 1.5–2.5(–3) mm diam. Leaves (of fertile twigs) small, 7–12(–15) cm long, top acute, or blunt, or rounded; lateral nerves 10–15(–18) pairs. Fruit 5–8 cm long, at first with scurfy tomentum, hairs c. 0.2 mm, (late) glabrescent. Hairs of tomentum of flowers 0.2–0.5 mm long .... **M. gigantea** King

b. Twigs generally stouter, leaves larger, the top acute-acuminate; lateral nerves 13–22 pairs. Hairs of tomentum of fruit larger, c. 0.5 mm long or more. Hairs of flowers 0.5–1 mm long 15

15a. Diameter of twigs towards the apex (2–)2.5–4 mm. Leaves chartaceous or thinly coriaceous. Fruit 7–9 cm long, at first with rather scurfy tomentum with hairs c. 0.5 mm, glabrescent. Male perianth 6–7 mm, with hairs 0.5–1 mm .. .. **M. maingayi** Hook. f.

b. Twigs towards apex 3–6 mm diam. Leaves coriaceous. Fruit (5–)6–7 cm long, with conspicuous persistent tomentum with shaggy hairs 1–2 mm long. Male perianth 4–4.5 mm, with hairs 0.5–1 mm ..... **M. lowiana** King

6. BORNEO — 20 (21) species and 2 subspecies [See Key below]

M. beccarii
M. borneensis
M. cinnamomea
*M. **corticaca***
M. crassa
*M. **depressa***
M. elliptica
*M. **extensa***
M. fallax
M. fatua subsp. *fatua*
M. gigantea
M. guatteriifolia
M. iners
M. lowiana
M. malaccensis
subsp. *malaccensis*
subsp. ***papillosa***
M. maxima
M. papyracea
M. simiarum subsp. ***calearea***
M. smythiesii
M. villosa
M. wyatt-smithii (?)

REGIONAL KEY TO THE SPECIES OF BORNEO

(Applicable for male- and female-flowering and fruiting specimens, using preferably sterile characters)

1a. Tomentum of sterile terminal leaf bud short, composed of minute appressed hairs 0.1–0.2(–0.3) mm long, or less 2
b. Tomentum with hairs more than 0.2 mm long 14
2a. Lower leaf surface with persistent or subpersistent dense tomentum (hairs may be very small), old leaves sometimes glabrescent. Fruit with minute scurfy tomentum with hairs c. 0.1 mm. Inflorescences with distinct common peduncle (often short in female inflorescences) 3
b. Lower leaf surface glabrous or early glabrescent or with scattered (not dense) minute hairs. Fruit with various tomentum or glabrous or glabrescent 5
3a. Perianth in bud (best to be seen in male flowers) usually angular in the upper portion. Twigs slender, towards the apex 1.5–2.5(–4) mm diam. Leaves (8–) 10–22 cm long, lateral nerves 10–17 pairs. Fruit (dry) 5–9 cm long, often subsessile (check also *M. smythiesii*) ..... **M. cinnamomea** King
b. Perianth not angular. Twigs stouter; leaves larger, with more lateral nerves per side 4
4a. Twigs stout, towards the apex (4–)5–8 mm diam. Leaves 16–40 cm long, drying dark brown; lateral nerves (20–)23–33 per side. Fruit 6–9 cm long ..... **M. maxima** Warb.
b. Twigs towards apex 2–3 mm diam. Leaves 15–30 cm long, drying olivaceous; nerves 16–23 per side. Fruit 5–7 cm long ..... **M. depressa** W. J. de Wilde
5a. Fruit glabrous or glabrescent or with minute remote hairs; in glabrescent fruit sometimes some minute tomentum remaining in sheltered places near the insertion of the fruit stalk. Inflorescences peduncled; perianth largely glabrous (except in *M. gigantea* and *M. papyracea*) 6
b. Fruit with persistent dense-scurfy tomentum, or partly glabrescent but with dense tomentum remaining in sheltered places on the fruit. Inflorescences sessile (as in *Knema*) or peduncled; perianth pubescent 11

6a. Perianth in bud (especially in male flowers) sharply angular in the apical portion. Twigs and leaves usually drying conspicuously yellowish; lateral nerves 8–13(–15) pairs. Fruit drying dark brown or blackish, often with a greenish-yellowish exudation, 4.5–7.5 cm long, glabrescent, at first with minute tomentum with scattered hairs c. 0.1 mm. — Plant often from marshy forest ... . **M. elliptica** Wall. ex Hook. f. & Thomson

b. Perianth in bud not angular. Twigs drying yellowish brown or brown, leaves olivaceous or brown; lateral nerves 10 pairs or more 7

7a. Lines of interarching of lateral nerves on lower leaf surface (of mature leaves) indistinct 8

b. Lines of interarching generally raised and distinct 10

8a. Bracteole (in male flowers) subpersistent or late caducous. Leaf apex acute-acuminate; lower leaf surface not papillose. Fruit 3–6(–8) cm long, (dry) pericarp 3–10 mm thick 9

b. Bracteole caducous. Leaf apex of leaves of fertile twigs acute or blunt; lower leaf surface papillose. Fruit 5–8 cm long, (dry) pericarp 15–20 mm thick ... . **M. gigantea** King

9a. Leaves membranous or chartaceous, or subcoriaceous, 7–24 cm long. Common peduncle of female inflorescences and infructescences to 1 cm long. Fruit 4–6 (–8) cm long, (dry) pericarp 4–10 mm thick, late or early glabrescent. Male perianth 4–6(–7) mm long ..... **M. iners** Blume

b. Leaves thinly membranous, 7–14 cm long. Common peduncle of female inflorescences and infructescences slender, 1–2.5 cm long. Fruit 3–4 cm long, early glabrescent; dry pericarp 3–4 mm thick. Male perianth c. 3 mm .... **M. fallax** Warb.

10a. Twigs towards the apex 2–4 mm diam. Leaf blade index more than 2; lateral nerves 14–20 per side; lower leaf surface papillose or not, or but indistinctly papillose. Male perianth 3–3.5 mm long. Female perianth 2–2.5 mm long. Fruit 4–6 cm long ..... **M. malaccensis** Hook. f.

b. Twigs stout, towards the apex 4–8 mm diam. Leaves generally large and comparatively broad, 16–44 by 8–14.5(–18) cm, top blunt or acute, not acute-acuminate, base ± rounded or subcordate; nerves (16–)20–28 per side; lower leaf surface papillose. Male perianth 6–8 mm long. Female perianth c. 6 mm long. Fruit 7–9 cm long ..... **M. papyracea** J. Sinclair

11a. Inflorescences (and infructescences) with common peduncle and ± ramified 12

b. Inflorescences sessile, as in the genus *Knema*: a short, scar-covered sessile brachyblast. Leaves chartaceous or thinly coriaceous ..... **M. crassa** King

12a. Leaves large; lateral nerves 16–30 per side. Inflorescences large, widely or narrowly long-paniculate, 6–18 cm long in male, (1.5–)5–9 cm long in female. Fruit 6–8 cm long 13

b. Leaves generally smaller; lateral nerves 13–20(–22) per side. Inflorescences smaller. Fruit (4.5–)5–7.5 cm long. Male perianth 3–4 mm .... **M. borneensis** Warb.

13a. Twigs stout, towards the apex (4–)5–8 mm diam. Leaves: lateral nerves (20–) 23–30 pairs; marginal arches ± distinct; papillae apparent or indistinct. Male perianth 5–7 mm ..... **M. maxima** Warb.

b. Twigs towards the apex 2.5–5 mm diam. Leaves: lateral nerves 16–24 pairs; marginal arches ± indistinct; papillae not apparent. Male perianth 4(–4.5) mm ..... **M. extensa** W.J. de Wilde

14a. Twigs stout, towards the apex 5–10 mm diam.; bark usually conspicuously cracking and flaking. Leaf bud and fruit with very conspicuous villous tomentum with hairs (1–)2–3 mm long. Inflorescences sessile ... **M. villosa** Warb.

b. Twigs slender to stoutish, 6 mm diam. or less. Tomentum of the leaf bud with hairs c. 1.5 mm long or less 15

15a. Mature leaves pubescent beneath. Fruit 2.5–4.5 cm long 16

b. Lower surface of mature leaves glabrous. Fruit 5 cm long or more 20

16a. Inflorescences (best to be seen in male specimens) paniculate, i.e. ramified and with distinct ± flattened main peduncle, with flowers in subumbels or spikes. Fruit 2.5–4.5 cm long 17

b. Inflorescences of the *Knema*-type (sessile or subsessile scar-covered short-shoots lasting several flowering seasons). Fruit densely pubescent, 2.5–3.5 cm long. Tomentum of leaf bud with hairs up to 0.5(–1) mm. — Inland species; not from limestone 18

17a. Twigs stoutish; leaves (12–)15–35 cm long, lateral nerves 15–19(–25) pairs. Tomentum of leaf bud with hairs to 1(–1.5) mm long. Perianth not angular. Fruit 2.5–4.5 cm long, densely shaggy pubescent with hairs 0.5–1 mm long. — Mainly a coastal species, but sometimes inland in secondary forest .... **M. guatteriifolia** A.DC.

b. Twigs more slender; leaves smaller, lateral nerves 10–18 pairs. Tomentum of leaf bud with appressed hairs 0.5–1 mm long. Perianth in bud sharply angular apically. Fruit 3.5–4 cm long, glabrescent or with thin tomentum with scattered pale brown appressed hairs up to 0.5 mm. *W Sarawak, W & NE Kalimantan*; mostly from limestone **M. simiarum** A.DC. subsp. **calcarea** W.J. de Wilde

18a. Twigs towards the apex 2–3 mm diam. Leaves thinly coriaceous, base rounded or short-acute; nerves not distinct above. Fruit 2.5–3.5 cm long, with scurfy tomentum with hairs 0.2–0.3(–0.5) mm long .... **M. smythiesii** J. Sinclair

b. Twigs stouter, towards the apex 3–4(–5) mm diam. Leaves coriaceous, base rounded or emarginate, sometimes short-acute; nerves distinct above. Fruit 2.5–3.5 cm long, with woolly hairs 0.5–1 mm 19

19a. Male flowers: androecium ± sessile, with a collar of conspicuous hairs around base, sterile apex ± pubescent ..... **M. beccarii** Warb.

b. Androecium with distinct androphore, sterile apex without hairs. — *Kuswata 886*, male fl., from *SE Kalimantan* ..... see **M. fatua** Houtt. subsp. **fatua**

20a. Fruit glabrous (early glabrescent). Lower leaf surface not papillose, concolorous with upper surface 21

b. Fruit either with persistent tomentum, or late glabrescent, or early glabrescent in *M. gigantea*. Lower leaf surface distinctly papillose, generally paler than upper leaf surface 22

21a. Leaves usually membranous, to 24 cm long, base usually attenuate. Twigs towards apex up to 4 mm diam., smooth or striate, the bark of the twigs lower down cracking or not; terminal leaf bud slender. Fruit to 8 cm long, dry pericarp 5–10 mm thick. [Stout forms, mainly from *NE Borneo*.] ... **M. iners** Blume

b. Leaves larger, chartaceous, base broadly rounded. Twigs towards the apex (4–)5–6 mm diam., bark early conspicuously cracking; the terminal leaf bud stout. Fruit 7.5–9.5 cm long, dry pericarp 15–20 mm thick. *NE Borneo* ..... **M. corticata** W.J. de Wilde

22a. Twigs slender, towards apex 1.5–2.5(–3) mm diam. Leaves (of fertile twigs) small, 7–12(–15) cm long, top acute, or blunt, or rounded; lateral nerves 10–15 (–18) pairs. Fruit 5–8 cm long, at first with scurfy tomentum with hairs c. 0.2 mm, (early or late) glabrescent ..... **M. gigantea** King

b. Twigs generally stouter, towards apex 3–6 mm diam.; leaves larger, coriaceous, the top acute-acuminate; lateral nerves 13–22 pairs. Fruit (5–)6–7 cm long, with conspicuous persistent tomentum with shaggy hairs 1–2 mm long ..... **M. lowiana** King

7. PHILIPPINES — 20 (21) species, 3 subspecies and 1 variety [See Key below]

M. agusanensis
subsp. *agusanensis*
subsp. ***squamulosa***
M. basilanica
M. cacayanensis
M. cinnamomea
M. colinridsdalei
M. cumingii
M. elliptica (?)
M. fatua subsp. *fatua*
M. frugifera
M. guatteriifolia
M. cf. *iners*
M. laevis
subsp. ***badia***
subsp. *laevis*
M. longepetiolata
M. mindanaensis
M. nivea
M. philippensis
M. pilosigemma
M. rubrinervis
var. ***duplex***
var. ***rubrinervis***
M. simiarum
subsp. ***celebica***
subsp. *simiarum*
M. umbellata
M. wenzelii

REGIONAL KEY TO THE SPECIES OF THE PHILIPPINES

(Applicable for male- and female-flowering and fruiting specimens, using primarily sterile characters)

1a. Lower leaf surface with persistent dense tomentum (the hairs may be small, but they are densely interwoven) 2

b. Lower leaf surface with ± spaced silky hairs, or with a very minute cobweb-like covering seen with a lens only, or glabrous or glabrescent 7

2a. Tomentum of sterile terminal leaf bud conspicuous, with hairs (0.1–)0.5–1 mm long. Inflorescences usually peduncled. Fruit (when dry) 2.5–4 cm long, with conspicuous shaggy tomentum with hairs 0.5–1(–2) mm ..... **M. guatteriifolia** A.DC.

b. Tomentum shorter 3

3a. Twigs stout, towards the apex (3–)4–8 mm diam. Leaves (15–)20 cm long or more. Inflorescences sessile, without common peduncle, as in the genus *Knema*. Tomentum of fruit with hairs minute or longish, to 1 mm long 4
b. Twigs more slender, 1–2.5(–4) mm diam. Leaves small or medium, (5–)8–22 cm long. Inflorescences peduncled. Tomentum of fruit short, scurfy, with hairs 0.1–0.2 mm 6
4a. Leaves narrowish, oblong-lanceolate, (15–)20 cm long, coriaceous; petiole proportionally long. *NE Luzon: Palanan area* . **M. colinridsdalei** W. J. de Wilde
b. Leaves herbaceous or chartaceous, generally elliptic-oblong, larger 5
5a. Twigs stout, towards the apex 5–8 mm diam. Leaves rather tapered (narrowed) in the lower half, nerves 30–35 pairs; lower leaf surface with whitish dense felty tomentum with hairs 0.1 mm or less, appearing as if glabrous (lens!). Fruit 6–6.5 cm long ..... **M. wenzelii** Merr.
b. Twigs moderately stout. Tomentum of lower leaf surface yellowish brown, with hairs 0.1–0.2(–0.5) mm. Fruit 3.5–6.5(–7) cm ..... **M. fatua** Houtt.
6a. Tomentum of lower leaf surface persistent (the hairs minute). Midrib beneath brown or yellowish. Fruit 5–9 cm long. Recorded by Sinclair (Gard. Bull. Sing. 23, 1968) for Mindanao: *Ahern 421* (specimen not seen) .... **M. cinnamomea** King
b. Tomentum of lower leaf surface late-falling. Midrib beneath purplish, contrasting with greyish lower leaf surface. Fruit 3–7 cm long. *Palawan, Mindoro* ... . **M. rubrinervis** W. J. de Wilde
7a. Perianth in bud narrowed to the top, the apical portion sharp-angular. Inflorescences usually peduncled, and branched. Fruit smallish, with scattered hairs or glabrescent. (Including *M.* cf. *elliptica* Hook. f. & Thomson.) .... **M. simiarum** A.DC. ..... subsp. **simiarum** & subsp. **celebica** (Miq.) W. J. de Wilde
b. Apical portion of perianth in bud not or not sharply angular. Inflorescences sessile or peduncled. Fruit various 8
8a. Leaves chartaceous or coriaceous; petiole proportionally long. Inflorescences (infructescences) sessile. Fruit large, (5–)6–7 cm long, with minute dark rusty scurfy tomentum 9
b. Leaves chartaceous, coriaceous, or membranous; petiole proportionally shorter. Inflorescences sessile or provided with a peduncle. Fruit large, or smaller . 10
9a. Leaves coriaceous; lateral nerves (15–)20 per side. Twigs towards apex 4–6 mm diam. *NE Luzon: Palanan area* ..... **M. colinridsdalei** W. J. de Wilde
b. Leaves thinly coriaceous; nerves c. 10 per side. Twigs towards apex 2–3 mm diam. Petiole proportionally long. *Luzon, Biliran Is.* .... **M. longepetiolata** W. J. de Wilde
10a. Twigs stout, towards the apex 3–5(–10) mm diam. Leaves large, to 45 cm long. Inflorescences or infructescences provided with a peduncle. Fruit large, (4–)5–8 cm long, with persistent tomentum 11
b. Twigs more slender, 1–5 mm diam. Fruit either small, pubescent or glabrescent, or fruit large, glabrescent 12
11a. Tomentum of sterile terminal leaf bud with hairs 1(–2) mm long. Tomentum of fruit with hairs 0.3–0.5 mm long ..... **M. philippensis** Lam.

b. Tomentum of sterile terminal leaf bud with hairs 0.1–0.2(–0.3) mm. Fruit with scurfy tomentum with hairs c. 0.1 mm. [Male and female flowers not known.] ..... **M. frugifera** W.J. de Wilde

12a. Twigs slender, towards the apex 1–2 mm diam. Fruit 3.5–4 cm long, at first with minute tomentum, soon glabrescent. Lower leaf surface mostly distinctly papillose. Bracteole in female flowers inserted well below the perianth. *Palawan* ..... **M. umbellata** Elmer

b. Twigs slender or medium. Fruit smallish, pubescent, or fruit larger. Lower leaf surface papillose or not. Bracteole inserted at apex of pedicel 13

13a. Lower leaf surface smooth, i.e. with the lateral nerves flat or but slightly raised, not to be felt with the finger; lower leaf surface very distinctly papillose (lens!). Leaf blade lanceolate, lateral nerves 20–30 pairs. Pericarp thick, c. 10 mm thick ..... **M. laevis** W.J. de Wilde

b. Leaves elliptic or lanceolate, lateral nerves c. 20 pairs or less, flat(tish) or generally raised beneath; papillae absent or present, conspicuous or not (lens!) 14

14a. Nerves either ± patent or rather oblique, i.e. at an angle of c. 45° or less with the midrib. Inflorescences (best to be seen in male specimens) essentially provided with a peduncle, with the flowers grouped in subumbels 15

b. Nerves generally more patent, at an angle of c. 45° or more with the midrib. Inflorescences usually few-flowered, much reduced, sessile, of the *Knema*-type, i.e. flowers at the end of sessile scar-covered, wart-like short-shoots lasting several flowering seasons 17

15a. Nerves subpatent, at an angle of (45–)60° with the midrib. Lower leaf surface not papillose. *Mindanao (Surigao)* ..... **M.** cf. **iners** Blume (*Wenzel 3537*)

b. Nerves more oblique. Lower leaf surface ± papillose 16

16a. Fruit 3–4.7 cm long, with dull greyish brown scurfy tomentum. Midrib on the lower leaf surface yellowish brown or brown when dry ..... **M. agusanensis** Elmer

b. Fruit 3–7 cm long, with bright dark rusty or orange-brown scurfy tomentum. Midrib on lower leaf surface drying dark purplish or reddish, much contrasting ..... **M. rubrinervis** W.J. de Wilde

17a. Leaves below rather whitish, contrasting with upper surface; lower leaf surface minutely punctate (but not dotted; lens!), caused by scars of fallen larger hairs 18

b. Lower leaf surface generally not contrasting, not punctate (if lower leaf surface palish, then not punctate) 19

18a. Twigs medium or slender; leaves medium (c. 20 cm long or less). Fruit ellipsoid, c. 3.5 cm long, with rather conspicuous fine-woolly tomentum with hairs c. 0.5(–1) mm long. Tomentum of sterile terminal leaf bud with hairs c. 1 mm long. *Mindanao, Samar* ..... **M. pilosigemma** W.J. de Wilde

b. Twigs stout; leaves large, 20–40 cm long, grey-whitish beneath. Fruit ellipsoid, 3.5–4 cm long, with tomentum with hairs c. 0.1 mm or less. Tomentum of sterile leaf bud shorter. *Mindanao* ..... **M. nivea** Merr.

19a. Bark of twig soon cracking or/and flaking. Fruit c. 6 cm long, glabrous (glabrescent). [Male flowers not known.] *Basilan I.* **M. basilanica** W.J. de Wilde

b. Bark not or little cracking and flaking. Fruit smaller, with minute tomentum 20

20a. Twigs stoutish, towards the apex 3–4 mm diam., lower down densely set with lenticels. Leaves coriaceous. Fruit subglobose, 3–4 cm long, with tomentum with hairs 0.1–0.2 mm. Mainly a coastal species. *S Taiwan, N Luzon* .... **M. cacayanensis** Merr.

b. Twigs generally more slender, towards the apex (1–)1.5–3 mm diam.; lenticels present or ± absent. Leaves membranous or chartaceous 21

21a. Lenticels of twigs few and inconspicuous. Fruit subglobose or ellipsoid, 3.5–5 (–5.5) cm long; the tomentum with hairs c. 0.1 mm .... **M. cumingii** Warb.

b. Lenticels present, distinct or not. Fruit generally smaller, ellipsoid, (2.5–)3–3.5 (–4.5) cm long; the tomentum short, with hairs 0.1–0.2 mm. Leaves rather large, 14–35 cm long. *Mindanao*, and *Moluccas* .. **M. mindanaensis** Warb.

8. SULAWESI — 8 species [See Key below]

*M. **devogelii***	*M. **kjellbergii***
M. fatua	*M. koordersii*
subsp. ***affinis***	*M. simiarum*
M. impressa	subsp. ***celebica***
M. impressinervia	*M. **ultrabasica***

Note — Most taxa are endemic to Sulawesi; in the present article they include one new status and three new species.

REGIONAL KEY TO THE SPECIES OF SULAWESI

(Applicable for male- and female-flowering and fruiting specimens)

1a. Leaves large (15–)20–40(–50) cm; lower surface with persistent short dense tomentum. Inflorescences sessile, i.e ± without common peduncle (as in the genus *Knema*) ..... **M. fatua** Houtt. subsp. **affinis** (Warb.) W. J. de Wilde

b. Leaves generally smaller; lower surface glabrous or glabrescent or with minute sparse tomentum 2

2a. Inflorescences (or infructescences) with a common peduncle. Perianth in bud with angled apical portion. Fruit glabrescent or with sparse greyish hairs .... **M. simiarum** A.DC. subsp. **celebica** (Miq.) W. J. de Wilde

b. Inflorescences sessile or peduncled. Perianth in bud in apical portion rounded, not angular (male flowers not known in some species). Fruit with (minute) rust-coloured indumentum 3

3a. Twigs slender, towards the apex 1–2 mm diam. 4

b. Twigs generally thicker. Inflorescences (sub)sessile, peduncle absent or to 2 mm long only (type like those of *M. fatua* or as found in the genus *Knema*)..... 5

4a. Leaves membranous, 9–19 cm long. Inflorescences slenderly peduncled, sometimes subsessile. Flowers small, conspicuously rough-hairy. [Fruit not known.] ..... **M. impressinervia** J. Sinclair

b. Leaves coriaceous, small, (2.5–)4–7.5 cm. Inflorescences sessile. Fruit ± ellipsoid, 2–2.5 cm long. *Ultrabasic soils of Central Sulawesi* .... **M. ultrabasica** W. J. de Wilde

5a. Leafy twig stoutish; leaves coriaceous; lower leaf surface not whitish, not minutely punctate (× 60). Fruit subglobose, c. 5 cm diam.; pericarp nearly woody, c. 10 mm thick. *Central Sulawesi* (conglomeratic or ultrabasic bedrock; 400 m altitude) ..... **M. devogelii** W. J. de Wilde

b. Leafy twigs medium; leaves generally membranous, lower surface usually conspicuously pale, minutely dark-punctate (but not dotted) (× 60) 6

6a. Female flowers and fruit (sub)sessile. Fruit subglobose, 2–2.5(–3) cm long; dry pericarp 1–3 mm thick, with tomentum with hairs 0.1–0.2 mm. [Male flowers not known.] *N, C & SW Sulawesi* ..... **M. kjellbergii** W. J. de Wilde

b. Female flowers and fruit stiped. Fruit ± ellipsoid, 3–4 cm long; dry pericarp 3–6 (–8) mm thick, hairs c. 0.1 mm long 7

7a. Fruiting pedicel (fruit stalk) 6–10 mm long, conspicuously pubescent with hairs 1–1.5 mm long. [Male flowers not known.] *NE Sulawesi (Minahasa)* ..... **M. koordersii** Warb.

b. Fruiting pedicel 3–5(–7) mm, glabrescent or with hairs to 0.5 mm long only. *Sulawesi except Minahasa* (incl. *Kjellberg 2990*) ..... **M. impressa** Warb.

9. MOLUCCAS (including ARU ISLANDS) — 20 species and 4 subspecies

M. alba
M. argentea (cultivated only)
M. bifurcata
  subsp. *bifurcata*
  subsp. *sulaica*
M. fatua
  subsp. *fatua*
M. fissurata
M. fragrans
M. insipida
M. inutilis
  subsp. *papuana*
    var. *papuana* *
M. lancifolia
  subsp. *lancifolia*
  subsp. *montana*
M. lepidota
  subsp. *lepidota*
  subsp. *montanoides*
M. mindanaensis
M. nivea *
M. perlaevis *
M. pubicarpa
M. robusta
M. sangowoensis
M. scripta var. *scripta* *
M. simiarum subsp. *celebica*
M. subalulata
M. succedanea
M. tristis *
  subsp. ***moluccana*** *
  subsp. ***sessilifructa*** *

Note — Since the account of *Myristica* for the Moluccas (De Wilde, Blumea 35, 1990, 233–260; with key), four more species and two subspecies (of *M. tristis*) (with * in the list above) have become known to occur in this area; how these fit in the key to the Moluccan species (l.c.: 234) is indicated in their treatment below.

10. LESSER SUNDA ISLANDS — 3 species, 1 variety

M. guatteriifolia (in this area known from Bali only)
M. rumphii
  var. ***florentis***
  var. *rumphii*
M. sumbawana

LIST OF ACCEPTED TAXA, ALPHABETICALLY ARRANGED

Myristica agusanensis Elmer, Leafl. Philipp. Bot. 8 (1915) 2775.

subsp. **agusanensis**

subsp. **squamulosa** W. J. de Wilde, *subspec. nov.*

Gymnacranthera lanceolata Merr., Philipp. J. Sc., Suppl. 1 (1906) 55; Elmer, Leafl. Philipp. Bot. 3 (1911) 1058 [non *M. lanceolata* Wall., Cat. (1832), nom. nud. = *Knema.*] — *Myristica lancifolia* Merr., Enum. Philipp. Flow. Pl. 2 (1923) 178 [non *M. lancifolia* Poir. (1816)], nom. nov., nom. inval. — Type: *Meyer FB 3236* (BO, K; NY, US, n.v.), Luzon.

A subspecie typica in foliis lanceolatis 9–13 cm longis infra pilis remote dispersis squamatis ad 0.1 mm longis brunneis serotine glabrescentibus differt. — Typus: *Meyer FB 3236* (K; iso BO, NY, US, n.v.), Luzon.

Leaf blades oblong-lanceolate or lanceolate, 9–13 cm long, top subacute or bluntish. Lower leaf surface at first with an inconspicuous tomentum consisting of widely spaced bright brown scale-like hairs 0.1 mm or less, late glabrescent. *Male inflorescences* paniculate, with a somewhat flattened common peduncle 5–20 mm long, the central branch short, up to 5 mm long, simple or with two stages, the inflorescences axillary to normal leaves or sometimes (*Loher 6716*) axillary to caducous reduced leaves and arranged in short-shoot-like twigs ending in a vegetative bud, not forming paniculate compound inflorescences. Tomentum of flowers with hairs 0.2–0.3 mm long. *Female inflorescences* c. 1.5 mm long, few-flowered. *Fruit* not seen.

Distribution — Central Philippines: Luzon, Sibuyan I. — Collections: *Elmer 12537*; *Loher 6716*, *Meyer FB 3236*.

Ecology — Lower montane forest. Fl. Apr., May, June.

Note — A few specimens included by Sinclair (1968: 218) in his concept of *M. agusanensis*, with smaller leaves of predominantly lanceolate-linear shape, and with a markedly different remotely scaly pubescence on the lower leaf surface, have here been separated from the typical into subsp. *squamulosa*. Apparently because of the small ellipsoid flowers and the inflorescences that are often compound (subsp. *agusanensis*) or grouped in short-shoots, this subspecies was originally described by Merrill under the genus *Gymnacranthera*.

Myristica alba W. J. de Wilde, Blumea 35 (1990) 238.

Myristica andamanica Hook. f.

Myristica andamanica Hook. f., Fl. Brit. India 5 (1886) 103; King, Ann. Roy. Bot. Gard. Calc. 3 (1891) 294, pl. 115; Warb., Mon. Myrist. (1897) 411; Brandis, Indian Trees (ed. 1906 & 1911) 524; Parkinson, For. Flora Andaman Is. (1923) 223, pl. 3, f. 53; J. Sinclair, Gard. Bull. Sing. 23 (1968) 427, f. 75 A–E. — Type: *Kurz s.n.*; *King's Coll. s.n.*, 1884, male fls. (BM lecto).
Myristica elliptica auct. non Wall. ex Hook. f. & Thomson: Kurz, Fl. Burma 2 (1877) 282.

Tree 8–25 m. *Twigs* subterete, towards the apex 3–4 mm diam., glabrous (very early glabrescent), smooth to coarsely striate, drying yellowish to (dark) brown, bark

lower down coarsely striate, not longitudinally cracking, nor flaking; lenticels not obvious. *Leaves* thinly chartaceous, (broadly) elliptic to elliptic-oblong, sometimes nearly rhombic, broadest usually at or sometimes slightly above the middle, variable in size, 14–35 by 4.5–14.5 cm, top acute or acute-acuminate, base acute, rarely narrowly rounded-acute, margin straight or somewhat rolled-in; upper surface somewhat glossy olivaceous-brown, glabrous, lower surface drying paler, olivaceous-brown or silvery greyish brown, either glabrous (early glabrescent, see note 3) or usually late glabrescent or with persistent very low but dense tomentum, silky to the touch, composed of silvery or pale brown scale-like hairs less than 0.1 mm long; lower surface not papillose; midrib above flat or slightly raised, nerves 12–22 pairs, flattish or usually conspicuously impressed above, at an angle of 45–60°; reticulation ± scalariform, faint or indistinct on both surfaces, lateral arches distinct or not; the petiole 20–35 by 3–5 mm; leaf bud slender, acute, 12–16 by 2–3 mm, densely grey-brown pubescent with appressed hairs less than 0.1 mm. *Inflorescences* often somewhat supra-axillary, more or less of the *Knema*-type: a simple or sometimes bifurcate woody tubercle, covered with pedicel- and bract-scars, up to 10 mm long, subsessile or on an up to 5 mm long smooth peduncle; if bifurcate then the branches are sometimes up to (2–)3 mm long, rarely also with a central branch up to 3 mm; apparently of long duration and probably producing flowers for several seasons. *Flowers* rusty-tomentulose outside; in male flowers few to many in a cluster; female inflorescences (seen in infructescences) sessile, few-flowered. *Male pedicel* slender, (6–)7–9 mm long; bracteole semi-orbicular, persistent, surrounding the lower half of the perianth at one side, 2.5(–3) mm long, acute or ± 3-lobed at apex, tomentulose (hairs scattered, c. 0.1 mm or less); mature male perianth in bud coriaceous, ovoid-ellipsoid to ellipsoid-oblong, c. (4–)5 by 3–4 mm, valves 3, splitting the perianth for about (1/4–)1/3, lobes in anthesis slightly reflexed; androecium 3.5–4 mm long; synandrium cylindrical, 2–2.5 mm long, anthers (6–)8(–10), mutually appressed, at apex with or without a blunt sterile apiculus up to c. 0.3 mm; androphore slightly more slender than synandrium, 1–1.5 mm long, nearly glabrous or with some palish minute hairs less than 0.1 mm. *Female flowers* not seen. *Fruit* 1 or 2 in a (sub)sessile inflorescence, ovoid or ovoid-oblong, apex and base obtuse, 4.5–5.5(–6.5) by (2.5–)3–3.5 cm, powdery dull-brown pubescent with hairs c. 0.1 mm, partly glabrescent, pericarp 5(–10) mm thick; seed ellipsoid, 3.5–4 cm long; fruit stalk 5–7 mm long.

Distribution — *Myristica andamanica* is endemic and the only species of the genus in the Andaman and Nicobar Islands. — Collections: Middle & South Andaman: *Kurz s.n.*, 2 Feb. 1875; *King's Coll.* (1884, 1892); *Parkinson 669*; *Balakrishnan & Bhargava 3612*; *de Wilde 20996*. Nicobar I.: *Didrichsen 3688* (C, not seen); North Nicobar (Car Nicobar), *Bot. Surv. India (Nair) 4576* (fr.).

Ecology — Not uncommon in evergreen hill forest, rain forest; mixed forest on rocky loam; at low altitudes. Fl. July–Aug., fr. Oct.–Feb./March.

Notes — 1. Fieldnotes. Handsome tree with horizontal branches and with stilt roots. Bark grey or blackish, with red sap. Leaves glossy dark green above, dull silvery to dull ferrugineous or coppery beneath. Flowers rusty tomentulose outside, glabrous cream-coloured inside. Fruit yellowish with brown scurf, or brown; seed blood-red.

2. In Sinclair's time a specimen in the Botanic Gardens of Singapore, planted in 1891 (received from King, Andamans), never flowered. In L there is a sterile herbarium specimen from this tree, with annotations by Sinclair. The leaves of this cultivated specimen are almost glabrous beneath; at most a few scattered minute scale-like hairs are present.

3. According to Sinclair (l.c.: 429, 434 table) this species is related to *M. crassa* and *M. teijsmannii*; I think its closest relationship is with *M. crassa*, although the latter has the leaves early glabrescent beneath, and differs in many more characteristics, e.g. the strongly papillose lower leaf surface.

4. The inflorescences of *M. andamanica* and *M. crassa* are interesting in that they exhibit inflorescences somewhat intermediate between the (sub)persistent *Knema*-type and the more temporary paniculate type.

5. Variation. This species is generally well-characterized by its microscopically fine and dense tomentum on the lower leaf surface, in addition to its typical general habit, with typical leaf shape, the lateral nerves impressed above, etc. However, a few specimens, e.g. *King's Coll.* (1884) and *Sinclair 10912* (culta, Singapore), deviate by the (almost) glabrous lower leaf surface. In this respect it should be mentioned that the presence or absence of a tomentum is an important character for most species in *Myristica*.

Myristica argentea Warb., Bot. Jahrb. 13 (1891) 311.

This species is indigenous of West New Guinea, and occurs in the Moluccas only cultivated.

Myristica basilanica W. J. de Wilde, *spec. nov.*

A *Myristica inerti* laminis folii infra papilloso, inflorescentiis pedunculo carentibus, fructibus ovoideis c. 6 cm longis glabrescentibus differt. — Typus: *Miranda FB18928* (BM; iso K, L; BO, P, S, US, n.v.), Philippines, Basilan I.

Tree. *Twigs* medium, towards the apex 2.5–3 mm diam., subterete, striate, yellowish brown; bark of the twigs lower down grey-brown, conspicuously cracking and flaking; lenticels absent or not apparent. *Leaves* membranous; blades elliptic-oblong or oblong, ± parallel-sided or broadest at or somewhat above the middle, 11–22 by 5–7.5 cm, base rounded or short-cuneate, top bluntish or mostly acute-acuminate; upper surface drying olivaceous, lower surface pale greenish yellow, papillose, glabrous, i.e. at first with scattered minute pale hairs 0.1 mm or less, early glabrescent, with hair-scars pale brown, scattered over the papillose surface, larger non-traumatic dots absent; midrib ± slender, flat above, lateral nerves (10–)13–17 per side, at an angle of (45–)60–80° with the midrib, sunken above, yellowish, much-raised beneath, lines of interarching fairly distinct, tertiary veining coarsely reticulate, yellowish, distinct; petioles 15–25 by 2–3 mm, yellow-brown, glabrescent; sterile terminal leaf bud medium, 10–15 by 3–3.5 mm, (sub)acute, with tomentum with appressed dull (grey-)brown hairs 0.2–0.3 mm. *Inflorescences* (sub)sessile, ± as in *Knema*; female inflorescences: common peduncle absent or up to 1 mm long, in some inflorescences with a central branch up to 1 mm long; inflorescences dull rusty pubescent with hairs 0.2–0.3 mm, with 3–6 flowers of about the same size in a cluster, flowers

dull-brown pubescent with hairs 0.1–0.2 mm. *Male inflorescences* and *flowers* not seen. *Female flowers:* pedicel (1–)2 by 1.5 mm, bracteole broadly ovate, rounded, c. 4 mm, late caducous, mature perianth broadly ovoid, c. 5 by 4–4.5 mm, perianth-lobes c. 1 mm, at sutures (0.2–)0.3 mm thick, ovary broadly ovoid or subglobose, c. 4 mm diam., with minute as well as longish (pale) brown hairs (0.1–)0.5–0.7 mm, stigma minutely 2-lobed. *Fruit* solitary, subsessile; fruiting pedicel not seen, fruit broadly ovoid, c. 6 by 4.5–5 cm, top and base broadly rounded, pericarp (when dry) 8–10 mm thick, glabrous (glabrescent); seed ellipsoid, c. 4 cm long.

Distribution — Philippines: Basilan Is. Known only from the type collection, *Miranda FB 18928*, Aug.–Sept.1912.

Ecology — Flowers and mature fruit Aug.–Sept.

Notes — Obviously the present new species is close to *M. iners*, which is widespread in West Malesia and in the Philippines only known from one ± deviating collection from Mindanao (Surigao), *Wenzel 3537* and quite different from the present type *FB 18928*.

Myristica basilanica is distinct from *M. iners* by its sessile, (almost) non-peduncled inflorescences, and leaves with papillose lower surface; it is distinct from the sometimes resembling and apparently also related *M. cumingii* by larger glabrous fruit, c. 6 cm long. The type specimens of *Gymnacranthera urdanetensis* Elmer, from Agusan Prov., Mindanao, are rather intermediate between the present *M. basilanica* and *M. cumingii*, but *G. urdanetensis* has been sunk into *M. cumingii* by Sinclair (1968: 437), and I can agree with this.Other satellite species of *M. iners* are *M. corticata*, *M. depressa*, *M. fallax*, and *M. umbellata*.

The type collection on which the present species is based, was named by Sinclair either *M. philippensis* (in herb. L) or *M. ceylanica* (in K).

Myristica beccarii Warb., Mon. Myrist. (1897) 518.

Occurs in Borneo; new for Sumatra by the collections *Laumonier 6150 & 6168*; hitherto not found in the Malay Peninsula.

Myristica beddomei King

Myristica beddomei King, Ann. Roy. Bot. Gard. Calc. 3 (1891) 291, pl. 118, f. 1–8.
For other references and typification see under the subspecies.

Tree 10–30 m; possibly with stilt roots when old. *Twigs* towards apex terete or subterete, 2–4 mm diam., early glabrescent, at first with very minute tomentum of brown or grey-brown hairs 0.1 mm or less, smooth or finely fissured, yellow-brown to blackish brown, bark of twigs lower down coarsely longitudinally striate or cracked, not rarely flaking; lenticels present or not. *Leaves* thinly chartaceous or subcoriaceous, elliptic to oblong, broadest at or somewhat above (rarely below) the middle, 7–31 by 3.5–12 cm, base narrowly rounded to attenuate, top acute-acuminate, sometimes bluntish; the upper surface glabrous, drying olivaceous or brown, lower surface usually conspicuously whitish by papillae or alveolar material (not so in subsp. *sphaerocarpa*), seemingly glabrous but in not too old leaves with minute widely scattered hairs less than 0.1 mm, or with very thin appressed greyish 'arachnoid' hairs less than 0.1 mm, or glabrous; midrib above rather narrow, glabrous, flat or some

what raised; lateral nerves 10–20 pairs, at an angle of 45–70° with the midrib, sunken above, bright brown or yellowish and usually contrasting beneath; tertiary venation usually distinct and contrasting, forming a coarse network (subsp. *beddomei*, subsp. *ustulata*), marginal arches usually indistinct; petioles 12–30 by 2–3(–4) mm; terminal leaf bud slender, acute, (10–)15–25 by 2–3 mm, densely rather conspicuously yellow brown to rusty pubescent with hairs (0.1–)0.2(–0.3) mm. *Inflorescences* essentially of the *Knema*-type; in *male:* sessile or with a smooth common peduncle up to 10 mm, brown pubescent with hairs c. 0.2–0.3 mm or glabrescent, and forked with 1–3(–6) elongated wart-like scar-covered short-shoots up to 10 mm long, not rarely with in addition a short central branch up to 5 mm bearing 1 or 2 similar wart-like short-shoots; flowers in loose or dense few- to many flowered subumbels of up to 20, the flowers generally of various age and size; bracts caducous; bracteoles (sub)persistent or caducous. *Female inflorescences* similar to male ones but shorter, less branched, and few (1–5-)flowered. *Flowers* densely yellow-brown to rusty-brown pubescent with hairs 0.1–0.5 mm. *Male flowers:* pedicel 3–5 mm long, perianth ovoid-oblong, 4.5–5(–6) mm long, not angular in transverse section; valves 3 (or 4), splitting the bud to about 1/4–1/3; androecium rather slender, the androphore about as long as the synandrium, (sub)glabrous or pubescent; anthers 5–10; sterile apex (0–)0.1–0.4 mm, bluntish. *Female flowers:* pedicel stoutish, 1–2 mm long; perianth ovoid, 4–6(–6.5) mm long, valves splitting the perianth to about 1/3, outcurved at anthesis; ovary minutely pubescent, stigma minutely 2-lobed. *Fruit* various, globose or ellipsoid, minutely brown scurfy-pubescent with hairs c. 0.1 mm. See further under the subspecies.

Distribution — India.

Note — As explained in note 4 under *Myristica ceylanica,* the Ceylonese and Indian *Myristicas,* excluding the more remote and quite different *M. magnifica* and *M. malabrica,* can arbitrarily be divided into five much related taxa, viz. 2 species in Sri Lanka and 1 species (*M. beddomei*, with 3 subspecies) in India. Pending the examination of more ample material and field study, the three subspecies can be tentatively distinguished as follows:

KEY TO THE SUBSPECIES

1a. Fruit ellipsoid or ellipsoid-oblong; dry pericarp 3–4 mm thick; mature aril yellow; fruit stalk pubescent. Tomentum of (male) flowers composed of hairs 0.3–0.5 mm long; anthers 5–7; bracteole half as long as the perianth, or shorter, persistent. Leaves grey-glaucous beneath ..... subsp. **ustulata** W. J. de Wilde

b. Fruit ellipsoid to globose; dry pericarp 4–10 mm thick; aril red; fruit stalk glabrous (glabrescent). Tomentum of (male) flowers with hairs (0.1–)0.2–0.3 mm; anthers 6–10; bracteole about half as long as the perianth, or longer, persistent or caducous 2

2a. Leaves smallish, lateral nerves 8–10 pairs; lower surface brown, without papillae. Fruit and seed globose (colour of aril not known) ..... subsp. **sphaerocarpa** W. J. de Wilde

b. Leaves various in size, lateral nerves 10–20 pairs; lower surface greyish or glaucous, papillose. Fruit ellipsoid or subglobose, seed ellipsoid . subsp. **beddomei**

subsp. **beddomei**

Myristica beddomei King, Ann. Roy. Bot. Gard. Calc. 3 (1891) 291, pl. 118, f. 1–8; Talbot, Syst. List Trees, Shrubs etc. Bombay Pres. (1894) 165; ed. 2 (1902) 280; Warb., Mon. Myrist. (1897) 504; Gamble, Man. Ind. Timbers (ed. 1902; 1922) 556; Cooke, Fl. Pres. Bombay 2, 2 (1906) 530; Talbot, For. Fl. Bombay Pres. and Sind 2 (1911) 380; Gamble, Fl. Pres. Madras 2, 7 (1925) 214. — *Myristica laurifolia* auct. non Hook. f. & Thomson: Bedd., Fl. Sylv. (1872) t. 267 (as regards the figure of the fruit only); Hook. f., Fl. Brit. India 5 (1886) 103 (for the Indian material only); Talbot, Syst. List Trees, Shrubs etc. Bombay Pres. (1894) 165; ed. 2 (1902) 280. — Type: no specimens indicated; Beddome plate 267 as for the fruit, and King plate 118.

Myristica contorta Warb., Mon. Myrist. (1897) 507, t. 16, f. 1–3. — Types: *Gibson s.n.* (A, n.v.; B†, K); *Talbot 225* (K, male fl., lecto); *Thomson s.n.* (K, fr.); *Gamble s.n.* (BM, fr.). See note 3 under subsp. *ustulata*.

Myristica laurifolia Hook. f. & Thomson var. *lanceolata* Hook. f., Fl. Brit. India 5 (1886) 103. — Type: *Beddome s.n. (263)* (K).

Myristica dactyloides auct. non Gaertn.: J. Sinclair, Gard. Bull. Sing. 23 (1968) 445, f. 78, p.p., excl. plants from Sri Lanka, and Indian material possibly mixed with subsp. *ustulata*.

Tree 10–30 m. *Twigs* towards apex smooth or striate, early glabrescent, sometimes brown or straw, 2–4 mm diam.; bark of twigs lower down coarsely striate or longitudinally cracking, without or with distinct lenticels. *Leaves* chartaceous to coriaceous, elliptic-oblong to oblong-lanceolate, base narrowly rounded to acute (cuneate), top acute(-acuminate); 10–31 cm long; lower leaf surface usually glaucous or greyish; nerves (12–)15–20 pairs; tertiary venation generally coarsely reticulate, contrasting beneath. *Male inflorescences* with up to 10 mm long common peduncle, ending in 1–6 fascicled *Knema*-like short-shoots, producing condensed, up to 30-flowered inflorescences with flowers strongly varying in age and size; *female inflorescences* 2–6-flowered; flowers densely pubescent with rusty hairs (0.1–)0.2–0.3(–0.4) mm, tomentum towards apex of perianth sometimes darker brown (but not blackish brown as in subsp. *ustulata*). *Male flowers:* pedicel rather stout, 2.5–5 mm long, bracteole ovate, 2.5–3.5 mm long, subpersistent or caducous; mature male perianth in bud (ovoid-)ellipsoid, top and base rounded, 4.5–5(–6) by 2.5–3 mm; valves 3, splitting the bud at anthesis to 1/4–1/3, valves at sutures c. 0.3 mm thick, androecium rather slender, reaching to the top of the perianth, (3.5–)4–4.5 mm long, synandrium ellipsoid-oblong, 1.8–2.5 by 0.8–1.3 mm, anthers 6–10, contiguous; sterile apex small, bluntish, (0.1–)0.2–0.4(–0.5) mm; androphore cylindrical, 1.8–2 by 0.7–1 mm, subglabrous with only minute hairs towards the base or densely minutely stellate pubescent with hairs 0.1(–0.2) mm. *Female pedicel* stout, c. 2 mm long, bracteole caducous, the mature perianth in bud ovoid, c. 6.5 by 5 mm, valves 3, somewhat outcurved at anthesis, splitting perianth for about 1/4, valves at sutures c. 0.3 mm thick only; ovary ovoid, 4–5 by 3 mm, minutely pubescent (with hairs c. 0.1 mm), stigma small, 2-lobed. *Fruit* 1 or 2 per infructescence, broadly ovoid or broadly ellipsoid to subglobose (sometimes drying ellipsoid), 4.5–5 by (2.5–)3–4 cm, the pericarp (dry) 4–10 mm thick, dull brown scurfy pubescent with hairs 0.1–0.2 mm, the fruit stalk (incl. infructescence) 5–10 mm long; seed ellipsoid, 3–3.5 cm long; aril red.

Distribution — S India: Mysore, Kerala, Madras, in the Western Ghats from Canara to Travancore. — Collections: *Barber 2942, 4108, 5547*; *Beddome s.n.* (male fl., immat. fr.); *Dalzell s.n.*; *Gamble 18294*; *Madras Herbarium 11327*; *Ridsdale 284*; *Saldanha 12972, 16136*; *Talbot 225*; *Wight 2487*; *Young s.n.*

Ecology — Wet deciduous forest, semi-evergreen forest, evergreen forest of foothills and montane areas; 300–1500 m altitude. Fl. Oct.–Jan., fr. Jan., March, May, June.

Note — Fieldnotes. Fruit globose, brownish; aril red. May become a large tree to 25 m tall, trunk dbh c. 70 cm. Old trees with stilt roots (fide Sinclair).

subsp. **sphaerocarpa** W. J. de Wilde, *subsp. nov.*

A subspecie typica in foliis parvis 7–10 cm longis infra non cinereo-glaucis, fructu globoso 3.5–4 cm diam., seminibus globosis c. 2.5 cm diam. differt. — Typus: *Kostermans 26276 (a)* (L), S India, Western Ghats.

Tree c. 10 m. *Twigs* towards apex glabrescent or late glabrescent, striate, 1.5–2 mm diam., bark of twigs lower down with a tendency of flaking, lenticels not apparent. *Leaves* chartaceous to thinly coriaceous, elliptic, or ovate-elliptic or obovate-elliptic, base cuneate, top acute or subobtuse, 7–10 by 3–5.5 cm; lower surface drying brown, glabrous or almost so; lateral nerves 7–10 pairs; tertiary venation not much contrasting. *Male inflorescences* and *male flowers* not seen. *Female inflorescences* a simple 2–4-flowered wart-like structure c. 1 mm diam., with a common peduncle 1–1.5 mm long. *Female flowers* pubescent with appressed golden-brown hairs 0.1–0.2 mm; pedicel c. 1 mm long; bracteole caducous; perianth in bud ovoid, c. 5 by 4 mm, valves 3, out-curved in anthesis, splitting perianth to c. 1/3, valves at sutures c. 0.3 mm; ovary ovoid, c. 2.5 mm, minutely pubescent. *Fruit* 1 or 2 per infructescence; globose, 3.5–4 cm diam., pericarp (dry) rather bony, c. 4 mm thick, outside densely scurfy-pubescent with cinnamon to rusty hairs c. 0.2 mm long; seed globose, 2.4–2.8 cm diam.; colour of aril not recorded; fruit stalk thick, 1–2 mm long.

Distribution — S India (Madras, Kerala), eastern slopes of Western Ghats, Tinnevelly Distr. — Collections: *Beddome s.n.* (BM; received 1885); *Kostermans 26276a, b.*

Ecology — Wet evergreen forest, 1000–1100 m altitude. Fr. July.

Notes — 1. Fieldnotes. Tree 10 m tall, 15 cm diam. Bark black, flaky, c. 1 mm thick; live bark 6 mm, red; fruit brown.

2. As shown in the key to the subspecies, this subspecies differs by its small, non-glaucous leaves and globose fruit containing globose seed. On the Beddome sheet in BM is written: "ceylanica or contorta, or new species, det. Warb." Male specimens are not known, and a closer study of the present taxon may cause a reappraisement.

subsp. **ustulata** W. J. de Wilde, *subsp. nov.*

A subspecie typica in floribus subtilioribus atro-brunneo pubescentibus pilis 0.3–0.5 mm longis, perianthii apice subobtuso, antheris 5–7, fructu ellipsoideo, pericarpio c. 4 mm diam. in sicco, arillo maturo luteo differt. — Typus: *Kostermans 25825* (holo L; iso K, BM), S India, E Madras.

Tree 15–25 m. *Twigs* at apex 2(–4) mm diam., rather late glabrescent; bark lower down rather flaking, lenticels absent or inconspicuous. *Leaves* (thinly) chartaceous, the base attenuate; lateral nerves 10–15 pairs; lower surface grey-glaucous, usually with contrasting coarsely reticulate tertiary venation. *Inflorescences* late glabrescent or with subpersistent tomentum, in male with clusters of 10–20 flowers of strongly various age and size; flowers densely bright yellow-brown pubescent with hairs

0.3–0.5 mm, the hairs longest on the bracteole and towards the apex of the perianth and there usually contrastingly dark coloured, often blackish brown as if burnt. *Male flowers:* pedicel rather slender, about as long as or slightly longer than the perianth, 4–6 mm; bracteole ovoid-ellipsoid, 1–3 mm long, persistent; mature perianth in bud ellipsoid or ellipsoid-oblong, top broadly rounded, 4.5–5.5 by 2–3.5 mm, usually upward-directed at an angle with the pedicel, valves 3, thin, at sutures 0.2–0.3 mm; androecium slender, 3.5–4 by 0.5–0.8 mm; synandrium cylindrical, 1.5–2 by 0.5–0.8 mm, anthers 5–7, contiguous, sterile apex 0.1–0.2(–0.4) mm, the androphore slender, cylindrical, 2 by 0.4–0.7 mm, subglabrous to rather densely minutely pubescent with hairs 0.1 mm or less, especially towards the base. *Female flowers* not seen. *Fruit* 1 or 2 per infructescence, ellipsoid, base rounded, top narrowly rounded, 3.5–4(–6.5) by 2–2.5(–3.5) cm (see note 4), dry pericarp 3–4 mm thick, with persistent scurfy rusty tomentum with hairs 0.1–0.2 mm; fruit stalk including whole infructescence 5–10 mm long, usually with subpersistent rusty tomentum; seed ellipsoid, 2.5–3(–5.5) cm long, mature aril yellow.

Distribution — S India: Kerala, E Madras, Anamallays (Anamalais). — Collections: *Beddome s.n.* (BM, received 1885, the lower specimens marked "B"); *Kostermans 25825, 26097, 26112, 26240.*

Ecology — Montane wet or rather dry evergreen forest, 500–1200 m altitude. Fl. June, Oct.; fr. June, July.

Notes — 1. Fieldnotes. Tree 15–25 m, 30–40 cm diam. Bole fluted, buttresses to 50 cm high and out. Bark dark brown or blackish, roughish or smooth, peeling off in 2–3 mm thick pieces; living bark 5–10 mm thick, orange-brown or red, containing red sap. Flowers yellowish; fruit brown; mature aril yellow.

2. The rather small ellipsoid fruit with a not very thick pericarp and yellow aril point to a close relationship with the Ceylonese *M. ceylanica* and *M. dactylifera*, both differing by their leaves being non-glaucous beneath and the shorter tomentum of the flowers.

3. I am not certain whether part of the syntypes of *M. contorta* Warb., at present in the synonymy of subsp. *beddomei*, might belong here. The fruit is described as elongated, and the pericarp as c. 3 mm thick, but in l.c., t. 16 fig. 1 it is drawn as much thicker.

4. *Kostermans 26097* is a specimen deviating by its large fruit, c. 6.5 by 3.5 cm, much larger than that in *Kostermans 26240*, a specimen vegetatively apparently identical with the male-flowering type specimen *Kostermans 25825.*

5. The blackish brown 'ustulate' colouring of the tomentum of the pedicels, bracteoles and apex of the perianth account for the epithet of the present subspecies. The same tendencies of darker colouring can be seen in collections of subsp. *beddomei* as well, but not as intensively dark blackish brown as in subsp. *ustulata.*

Myristica bifurcata (J. Sinclair) W. J. de Wilde, Blumea 35 (1990) 239.

[Basionym: *M. lancifolia* Poir. var. *bifurcata* J. Sinclair, Gard. Bull. Sing. 23 (1968) 460.]

subsp. **bifurcata**

subsp. **sulaica** W. J. de Wilde, Blumea 35 (1990) 241.

Myristica borneensis Warb., Mon. Myrist. (1897) 401.

This was included by Sinclair (1968) in *M. malaccensis* Hook. f.

Myristica cacayanensis Merr., Philipp. J. Sc. 17 (3, Sept. 1920) (1921) 255.

[Synonym: *M. ceylanica* A.DC. var. *cacayanensis* (Merr.) J. Sinclair, Gard. Bull. Sing. 23 (1968) 442, 444.]

A species close to *M. cumingii* Warb., with a restricted distribution in N Philippines (N Luzon) and Taiwan (Botel Tobago Is.).

Myristica ceylanica A.DC.

Myristica ceylanica A.DC., Ann. Sc. Nat. Bot. 4, 4 (1855) 29; Prodr. 14, 1 (1856) 190; Thwaites, Enum. Pl. Zeyl. (1858) 11 et l.c. in Addenda et Corrigenda (1864) 399 ('*M. zeylanica*'); King, Ann. Roy. Bot. Gard. Calc. 3 (1891) 289, pl. 111; Trimen, Handb. Fl. Ceyl. 3 (1895) 434 ('*M. zeylanica*'); Warb., Mon. Myrist. (1897) 505, t. 16; Willis, Rev. Cat. Fl. Pl. & Ferns Ceylon (1911) 75; Abeyesundere & De Rosayro (eds. Burtt-Davy & Hoyle), Draft First Descr. Check-List for Ceylon 4 (1939) 50; J. Sinclair, Gard. Bull. Sing. 23 (1968) 437, f. 77G (for the Ceylonese part of var. *ceylanica* only). — *Myristica amygdalina* auct. non Wall.: A.DC., Prodr. 14, 1 (1856) 190 sub *M. ceylanica*, nom. nud. in sched. CP 2923. — *Myristica laurifolia* Hook. f. & Thomson var. *ceylanica* (A.DC.) Trimen, Syst. Cat. Ceylon in J. Ceyl. Br. Roy. As. Soc. 9, 1, 30 (1885) 74 (also erroneously cited as var. *zeylanica* Thwaites); Hook. f., Fl. Brit. India 5 (1886) 103. — Type: *Thwaites C.P. 2923* (G; and in several more herbaria, see Sinclair, l.c.).

Tree, 10–30 m. *Twigs* towards apex terete or subterete, 2–3 mm diam., grey brown or yellowish brown, finely striate, at first with minute tomentum of grey-brown hairs 0.1 mm or less, early glabrescent; bark of twigs lower down coarsely striate, sometimes longitudinally cracking, grey-brown or dark brown, lenticels absent or inconspicuous. *Leaves* chartaceous to thinly coriaceous, elliptic-oblong to oblong-lanceolate, broadest generally at about the middle, 11–18 by 4–7 cm, top acute or acute-acuminate, base long- or short-attenuate or acute; blade above drying olivaceous, beneath glabrous or with scattered very minute hairs less than 0.1 mm, drying pale brown-olivaceous; midrib above ± slender, flat or slightly raised; lateral nerves 14–16 pairs at an angle of 45–60° with the midrib, rather faint and sunken above, beneath moderately raised, often somewhat yellowish, marginal arches indistinct; tertiary venation forming a lax network, indistinct or finely raised and rather distinct; petiole rather slender, 16–23 by 2–2.5 mm; terminal leaf bud ± slender, acute, 10–15 by 2–3 mm, densely grey-brown pubescent with hairs c. 0.1 mm. *Inflorescences* largely of the *Knema*-type: sessile or usually with common peduncle to 6 by 1.5–2 mm, glabrous (early glabrescent), terminally with one or two ± woody scar-covered shoot-shoots up to 8 mm long, (in male) each terminally with a subumbel of 2–5 flowers of strongly varying size and age; flowers light to bright brown pubescent with hairs 0.1(–0.2) mm; bracteole broadly ovate to subcircular, 2–2.5 mm long (in male), persistent; female inflorescences not known, according to infructescence small, subsessile, few-flowered. *Male flowers:* pedicel slender, 3.5–6 by 0.5–0.7 mm, mature male perianth in bud ovoid-ellipsoid to oblong, top and base rounded, (4–)4.5–5 by 2.5 mm; valves 3, at sutures 0.2–0.3 mm thick, at anthesis splitting the perianth to 1/4–1/3, the lobes suberect or slightly out-curved; androecium slender, c. 3.5 by 0.6(–0.8) mm; synandrium short-cylindrical, 1.5–2 by 0.6–0.7(–0.8)

mm; anthers 6–8, contiguous, sterile apex conspicuous, acute or bluntish, 0.3–0.5 mm long; androphore cylindrical or slightly tapering to above, 1–1.5 by 0.5–0.7 mm, glabrous or with very minute pale papilla-like hair-cells less than 0.1 mm. *Female flowers* not seen. *Fruit* solitary, subsessile on a short unbranched infructescence up to 6 mm long, ovoid, top somewhat tapering and slightly curved (always?), base rounded, 3.5–4 by 2–2.3 cm, minutely scurfy rusty pubescent with hairs c. 0.1 mm; dry pericarp c. 5 mm thick; fruit stalk stoutish, c. 4 mm long, at the apex without or with only a faint collar-like perianth remnant.

Distribution — Sri Lanka. — Collections: *Thwaites C.P. 2923* (male fl., fr.); *Davidse 8929* (somewhat deviating, see note 3); *Jayasuriya & Balasubramanium 533* (deviating and doubtful, see note 3).

Ecology — Remnants of intermediate forest, gallery forest in drier areas; 0–400 m altitude; not common. Fl. Dec., Jan.

Notes — 1. Apparently this is a rare species, known to me with certainty only from the male flowering and fruiting syntype specimens *Thwaites C.P. 2923*, with duplicates in various herbaria (see Sinclair, 1968: 441). It is particularly related to *M. dactyloides*, to which belongs the majority of the Ceylonese collections. *Myristica dactyloides* is a rather polymorphic species, common in the wetter areas, in forests up to 1500 m altitude, and it differs by a slightly stouter habit of twigs, generally broader leaves, stouter sessile inflorescences (without or with only a short smooth common peduncle), and by more robust male flowers: generally larger, with the pedicel stouter (thicker) and much shorter than the perianth, the bracteole larger and usually (late) caducous, a stouter androecium with more (7–12) anthers, and a usually broad and blunt sterile apex. The fruits of *M. dactyloides* in general much resemble those of the present *M. ceylanica* as well. Apparently the persistent collar-like perianth-remnant, distinct in *M. dactyloides*, is missing in *M. ceylanica*, but this needs confirmation by studying more material of the latter species.

2. Sinclair regarded *M. ceylanica* as also occurring in the Philippines, including what I accept as *M. cumingii* Warb., a species resembling in many aspects the present species but differing by characters as a larger and ± angular male perianth cleft to about halfway deep, a somewhat more hairy androphore, somewhat larger fruit, etc.

3. Deviating specimens. Besides *Thwaites C.P. 2923*, the only specimen seen by me which belongs here is *Davidse 8929*; it differs mainly by having the tertiary venation of the upper leaf surface rather flat-lying, and faint, whereas in *C.P. 2923* it is slightly raised. *Jayasuriya et al. 533* might belong here because of its rather small male perianths of c. 5 mm, with slender androecium, and persistent bracteole; it has sessile, non-stalked inflorescences and short pedicels, c. 2.5 mm long only, by which the specimen appears rather intermediate with the related *M. dactyloides*.

4. Status. As may appear from the key to the species and the key to the subspecies under *M. beddomei*, the discriminating characters of the five taxa here accepted (*M. ceylanica, M. dactyloides,* and *M. beddomei* and its three subspecies) are weak, and the true status of these taxa is not certain at all. For convenience's sake I have kept those from India apart from those from Sri Lanka on the species level. The two taxa restricted to Sri Lanka are retained, because both are known already on the species level and one of them, *M. ceylanica,* is an unsufficiently known and rare species, of which more material is needed for closer study.

The Indian taxa, though separated on weak-looking characters, are clear enough to warrant their distinction, but pending the examination of more material and field study, they are recognized at subspecific rank. Future study may either reveal that all five taxa should be regarded as species, or that they better can be united into one species, *M. dactyloides* Gaertn. (the oldest name), divided into some five or six subspecies.

Myristica cinnamomea King, Ann. Roy. Bot. Gard. Calc. 3 (1891) 292.

Myristica colinridsdalei W. J. de Wilde, *spec. nov.*

Per ramulorum habitum crassum distincta. Folia coriacea infra tomento subpersistenti denso brevi. Inflorescentiae sessiles verruciformes plerumque furcatae. Flores ferruginee pubescentes. Bracteola persistens parva. Antherae 8(–10). Fructus ovoideus c. 7 cm longus, pericarpio 10–12 mm crasso tomento dense atro-brunneo pilis c. 0.1 mm longis. — Typus: *Ridsdale c.s. ISU 499* (L), Philippines, Luzon, Palanan area.

Tree 18–40 m. *Twigs* several, pseudo-whorled, from near the apex of orthotropic shoots, grey-blackish or dark brown, minutely greyish or pale brown pubescent with hairs less than 0.1 mm, early glabrescent, stoutish, towards the apex 4–5(–6) mm diam., nearly smooth or striate, lower cataphylls leaving conspicuous half-circular scars; bark of twigs lower down coarsely striate or faintly cracking, with scattered coarse lenticels. *Leaves* coriaceous, usually ± crowded; leaf blades (elliptic-oblong or) oblong-lanceolate, ± parallel-sided or broadest at about the middle, 11–24(–30) by 3–6 cm, base ± cuneate or narrowly rounded, top acute or faintly acute-acuminate, apex acute or ± bluntish; upper surface drying dark olivaceous-brown, lower surface grey-brown, with subpersistent grey-brown tomentum of densely interwoven hairs 0.1 mm or less; midrib slender, slightly raised above, nerves 15–22 per side, at an angle of 45–60° with the midrib, flat or sunken above, purplish brown, rather contrasting below, lines of interarching indistinct; tertiary veining indistinct; petioles stoutish, 20–28(–35) by 2.5–3.5(–5) mm, drying blackish; sterile terminal leaf bud stoutish, acute, 15–20 by 3–4 mm, with dense appressed tomentum of grey-brown or (bright) rusty hairs 0.1(–0.2) mm. *Inflorescences* generally ± crowded, distichously along the twigs, in-between or below the leaves, sessile, without common peduncle, as in the genus *Knema*, i.e. a scar-covered simple or usually forked brachyblast, up to 10 mm long, short-pubescent, glabrescent, bracts small, caducous, terminally with a cluster of flowers; in male with 2–10 flowers of various stages of development according to age; flowers densely dark-rusty pubescent with hairs 0.1–0.3 mm, bracteole small, persistent or caducous, at the transition of pedicel and perianth. *Male flowers:* pedicel 1.5–3 by 1–1.5 mm, bracteole ± boat-shaped, c. 2 mm, persistent or caducous, mature perianth in bud ovoid-ellipsoid, 4–5 by 3–3.5 mm, top rounded, perianth hard-carnose, c. 4 mm thick, lobes c. 2 mm long, suberect at anthesis, androecium c. 4 by 1–1.5 mm, androphore subcylindrical, ± tapering, 1–1.5 by 1 mm, in the lower half or almost completely densely pubescent with pale brown hairs c. 0.1 mm or less, synandrium short-cylindrical, (2–)2.5 by (1–)1.2–1.5 mm, anthers (6–)8–10 (c. 20 thecae), contiguous, sterile apex bluntish or broad conical, 0.2–0.3 mm. *Female inflorescences* and *flowers* not seen. *Infruc-*

tescences sessile, 1- (or 2?-)fruited, below the leaves. *Fruit* (described from spirit-material) ovoid(-ellipsoid)-oblong, c. 7 by 4–5 cm, pericarp 10–12 mm, with dense short dark brown tomentum with hairs 0.1(–0.2) mm; seed ellipsoid, c. 3.5 cm; the fruiting pedicel 5(–10) by 8 mm.

Distribution — Philippines, endemic of the Palanan area, Isabela Prov., NE Luzon. — Collections: *Ridsdale c.s. ISU 114, 382, 499.*

Ecology — Forest on ultrabasic, low stature forest, with many large girth trees; streamside forest on ultrabasic; high canopy forest on low coastal hills. Locally common in flat, riverine areas; c. 50 m altitude. Fl. & fr. Apr.

Notes — 1. Fieldnotes. Tree 18–40 m, dbh 40–50 cm. Buttresses to 1 m, or with flying buttresses. Bark blackish, flaky or scaly; inner bark wine-red with watery sap, or streaky red with red sap. Leaves clustered at the ends of the branches, glaucous beneath. Flowers small, brownish. Fruit brown.

2. The almost whorled lateral branching, and somewhat clustered leaves at the end of the branches, is possibly typical for the species. Possibly confined to areas with ultrabasic rock.

Myristica corticata W. J. de Wilde, *spec.nov.*

Myristica inerti affinis sed crassior, in ramulis crassis 5–6 mm diam. apice versus, cortice mox conspicue rimoso, gemma terminali crassa grosse pubescenti, foliis magnis basi rotundata, floribus ferruginee lanato-pubescentibus pilis c. 1 mm longis, bracteola persistenti, fructu magno ellipsoideo-oblongo mox glabrescenti, pericarpio 15(–20) mm crasso in sicco. — Typus: *Krispinus SAN 87293* (L; iso K; SAR, SING n.v.), Sabah.

Tree 10–25 m. *Twigs* stout, towards the apex angular (4–)5–6 mm diam., early glabrescent, mostly coarsely irregularly longitudinally cracking, usually pale, greyish brown to (light) brown, lower down dark brown or blackish, coarsely cracking and flaking; no lenticels. *Leaves* chartaceous to thinly coriaceous, elliptic-oblong to oblong(-lanceolate), top acute-acuminate, base rounded, broadly rounded or subcordate, 15–35 by 6–11.5 cm; upper surface drying dull or glossy ± olivaceous brown, the lower surface dull, concolorous, virtually glabrous, papillae not obvious; midrib flat or slightly raised above; nerves 17–24 pairs, at an angle of 60–80° with the midrib, above flat or generally sunken, beneath distinctly raised and sharp; marginal arches mostly distinct; tertiary venation generally indistinct on both surfaces; petiole moderately stout, blackish brown, glabrous, 15–25 by 2.5–4 mm; leaf bud stoutish, conical, acute, 10–15 by (4–)5–6 mm, densely roughly pubescent with (bright) brown hairs c. 1 mm. *Inflorescences* paniculate, densely woolly rusty pubescent with hairs 1(–1.5) mm, in male 2–4.5 cm long, 2–3 cm broad, peduncle stoutish, flattened, 4–6 mm long, laterals 5–7 mm, central branch 20–40 mm, with 1–3 stages with flowers of various age clustered into subumbels of 5–10; bracts pubescent, caducous. *Flowers* woolly rusty pubescent with hairs 0.3(–0.5) mm, in male: pedicel rather slender, 4–6 mm, bracteole broadly ovoid, persistent, c. 3.5 mm; mature perianth in bud ovoid, 5–5.5 by 4–4.5 mm, top (narrowly) rounded, base rounded, valves 3, the perianth bud not angular, at anthesis splitting the perianth to about halfway, suberect, at sutures c. 0.2 mm; androecium rather slender, cylindrical, c. 4.5 by 0.8 mm, synandrium cylindrical, c. 3 by 0.8 mm, top bluntish with sterile apex

c. 0.2 mm, glabrous; anthers contiguous, 7 or 8; androphore cylindrical, c. 1.5 by 0.7 mm, conspicuously brown-pubescent with hairs 0.2–0.3 mm in the lower half. *Female flowers* not seen. *Infructescences* little-branched, 1.5–2 cm long, glabrescent; fruits 1 (or 2) per infructescence, ellipsoid-oblong, 7.5–9.5 by 4–5 cm, at first with rather dense tomentum of very minute scurfy hairs less than 0.1 mm long, early glabrescent, (glossy) dark brown, dry pericarp 15(–20) mm thick; seed ellipsoid-oblong, 4.5–5.5 cm long; fruit stalk (2–)5 mm long.

Distribution — Borneo: Brunei, Sabah. — Collections: Brunei: *Smythies BRUN 783*. Sabah: *SAN 22529, 35898, 87293, 88644*.

Ecology — Primary and logged-over lowland forest, low undulating country, hillsides; sandstone ridge with sandy clay soil; 0–500 m altitude. Fl. July, fr. May, Aug., Nov.

Notes — 1. Fieldnotes. Recorded with buttresses to 3 ft or with flying buttresses, 1 by 1 m. Bole straight; bark brown or blackish, cracked, coming off in small longitudinal thin flakes; outer bark hard and brittle, 1/10 in., inner bark 1/4 in., hard, orange-brown, reddish, or yellowish; sapwood pink, red, or light brown; cambium reddish; flowers yellowish; fruit ochre; seed coat black.

2. This species is obviously closely allied to the variable *M. iners*, and both have exactly the same non-papillose structure of the lower leaf surface (lens, × 60), which is almost concolorous with the upper surface.

The present species may be confused with certain stout specimens of *M. iners* as found in the north-eastern regions of Borneo, i.e., specimens with relatively large leaves, with the lateral nerves distinct below, and rather conspicuously woolly-pubescent inflorescences and flowers, as e.g. in *Kostermans 6789* or *SAN 21323*, or sometimes with large fruit, up to 8 cm long, as e.g. in *S 12320*. Our species, however, differs by having still stouter twigs, 5–6 mm diam., with very early coarsely cracking bark, by large leaves with 17–24 pairs of nerves very distinctly raised beneath, the blade base rounded, the marginal arches usually distinct (those of *BRUN 783*, Brunei, are rather faint, approaching the situation as in certain forms of *M. iners*). In *M. corticata* the terminal leaf bud is stout and rather broad, and conspicuously rough-haired. The inflorescences are rather short, with distinct loose woolly pubescence, as have the flowers; the bracteole is (sub)persistent (caducous in most of *M. iners*).

By its usually distinct marginal arches of the marginal nerve, the present species may be confused with certain forms of *M. malaccensis* and *M. extensa*; by its stout twigs with conspicuously cracking bark it is reminiscent of *M. papyracea* (a species with the lower leaf surface strongly papillose). Also *M. philippensis* from the Philippines may be resembling.

As a whole, *Myristica corticata* possibly can be regarded as a very stout-shaped outlying taxon of *M. iners* s.l., its position more or less comparable to that of the relation between the stoutly built *Knema lunduensis* with the variable *K. latericia* within the genus *Knema*, or as the laxly-shaped counterpart *M. fallax* in relation to *M. iners* s.l.

Collections of *M. corticata* were determined by Sinclair as aberrant specimens of either *M. malaccensis* or *M. papyraceae*; they were not included in *M. iners*, although Sinclair held a very wide conception of that species.

Myristica crassa King, Ann. Roy. Bot. Gard. Calc. 3 (1891) 293.

[Synonym: *M. suavis* King.]

This species was in Sinclair's time only known from the Malay Peninsula, Singapore, and Sumatra, but there are now recent records for Borneo (Sarawak, Brunei, W Kalimantan): *S 28098, 39718, 43025; Sinclair 10280; BRUN 186; van Balgooy & van Setten 5605.*

The only specimen, *Kerr 15014* (BM), cited by Sinclair (1968: 435) for Peninsular Thailand, has appeared to be *M. maingayi* Hook. f.

Myristica crassa appeared to be very closely related to the Javanese *M. teijsmannii.*

Myristica cumingii Warb., Mon. Myrist. (1897) 442.

[Synonyms: *Gymnacranthera negrosensis* Elmer, *G. urdanetensis* Elmer, *Myristica mindorensis* Merr., *M. nitida* Merr.]

Myristica dactyloides Gaertn.

Myristica dactyloides Gaertn., Fruct. 1 (1788) 195, t. 41 f. 2 a–b; Alston, Suppl. Handb. Fl. Ceylon 6 (1931) 247; Abeyesundere & De Rosayro (eds. Burtt-Davy & Hoyle), Draft First Descr. Check-List for Ceylon 4 (1939) 50; Worth., Ceylon Trees (1959) 350, with pl.; J. Sinclair, Gard. Bull. Sing. 23 (1968) 445, for the Ceylonese part only. — Type: *Hermann 588* (not located) and Gaertner's plate; typification according to Sinclair, l.c.: 449, 451–454, but supposed that the depicted fruit originates from Sri Lanka.

Myristica laurifolia Hook. f. & Thomson, Fl. Ind. 1 (1855) 163; A.DC., Prodr. 14, 1 (1856) 191; Thwaites, Enum. Pl. Zeyl. (1858) 11; King, Ann. Roy. Bot. Gard. Calc. 3 (1891) 290, pl. 112; Trimen, Handb. Fl. Ceylon 3 (1895) 434; Warb., Mon. Myrist. (1897) 509, t. 16 f. 1–3; Willis, Rev. Cat. Flow. Pl. & Ferns Ceylon (1911) 75. — Types: *Gardner 749* (BM, CGE); *Thwaites 416* (BM; iso BO, CAL, CGE, DD, G, Boiss., n.v.); *Walker [170]* (P), *s.n.* (FI., n.v.; K).

Myristica diospyrifolia A.DC., Ann. Sc. Nat. Bot. 4, 4 (Nov. 1855) 29; Prodr. 14, 1 (1856) 191 Type: *Thwaites 416* (= syntype *M. laurifolia*, see above).

Tree 10–40 m. *Twigs* towards apex terete or subterete, 2–3(–4) mm diam., faintly to distinctly rather coarsely striate, grey-brown to dark brown, at first with minute dull brown tomentum with hairs 0.1 mm or less, early glabrescent, bark of twigs lower down coarsely striate and usually longitudinally cracking, often finely flaking; lenticels present but not conspicuous. *Leaves* chartaceous to coriaceous, broadly ovate or elliptic to obovate-oblong or oblong-lanceolate, broadest at or below, or quite often above the middle, 10–22 by 4–10 cm, base rounded to short-attenuate, top acute or somewhat acute-acuminate, apex usually bluntish; upper surface glabrous, drying olivaceous, lower surface glabrous or at first with scattered minute hairs less than 0.1 mm, very early glabrescent, olivaceous-brown or brown (not greyish, whitish, or glaucous); midrib above conspicuous, flat to (slightly) raised; lateral nerves 12–17 pairs (and usually with some intercalary nerves), above slender, flat or sunken and well-visible, at an angle of 45–80° with the midrib, beneath moderately raised; tertiary venation forming a coarse network, sometimes ± trabeculate, above sunken and either faint or distinct; marginal arches indistinct; petiole 12–28 by 2–3.5 mm; leaf bud ± slender, 10–20 by 2–3 mm, top acute, often somewhat curved, densely grey-brown to rusty pubescent with hairs c. 0.1 mm. *Inflorescences* essentially of the *Knema*-type, sessile or with a stoutish, blackish brown common pedun-

cle up to 4 mm long, and with 1–3 scar-covered wart-like ramifications up to 10 mm long, subglabrous, in male each ending in a subumbel of 2–6 flowers of different size and age; female inflorescences (mainly according to the infructescences) similar but smaller and with less flowers, sessile or subsessile. *Flowers* densely dull-rusty pubescent with hairs 0.1–0.2 mm; bracteole subpersistent or late caducous. *Male flowers:* pedicel shortish and stout, often longitudinally striate, distinctly shorter than the perianth, 2–3 mm long; bracteole broadly ovate-elliptic or subcircular, early or late caducous, large or small (but at least 1/3 of the length of the perianth), 2.5–5 mm long, often 2-topped and 2-keeled; perianth broadly ovate-oblong, 4.5–6 by 3–4(–5) mm, valves 3, at anthesis splitting the perianth for 1/4–1/3, ± coriaceous, at sutures (0.2–)0.3–0.4 mm thick, suberect or ± out-curved; androecium stout, subcylindrical, 3.5–5.5 by 1–1.5 mm; synandrium subcylindrical, thickish, 2–3 by 1–1.5 mm, anthers 7–12, contiguous, sterile apex blunt or truncate, glabrous, 0.2–0.4 mm long, androphore subcylindrical, slightly tapering to above, 1.5–2 by 1–1.5 mm, glabrous or moderately to densely pubescent with pale or brown hairs less than 0.1 mm. *Female flowers:* pedicel stout, thick, 2–2.5 by 2 mm, mature perianth ovoid-ellipsoid, 4–4.5 by 3.5 mm, valves 3, at suture c. 0.4 mm, splitting bud to about 1/4(–1/3) (valves not seen at anthesis); ovary ovoid, 2(–2.5) by 2 mm, densely very minutely rusty pubescent (hairs less than 0.1 mm), stigma apical, small, minutely 2-lobed. *Fruit* solitary or 2 per infructescence, subsessile, ovoid or ovoid-ellipsoid or ovoid-oblong, 3–4.5(–5) by 2–2.5 cm, base broadly rounded, top (narrowly) rounded with acute usually ± uncinate tip 2–4 mm, pericarp (dry) (1–)1.5–4 mm thick, with scurfy dense rusty tomentum of minute hairs c. 0.1 mm; seed brown, ellipsoid or ovoid, 2.2–3(–3.5) cm; aril yellow (always?); fruit stalk stoutish, 1–3 mm long, at apex with a distinct collar-like perianth-scar up to 1 mm high, adjacent to the fruit.

Distribution — Sri Lanka (mainly C and SW). — Many collections.

Ecology — Lowland and (everwet) montane rain forest, forested hills, in the wetter part of the island; locally common; (0–)100–1500 m altitude. Flowers and fruit to be found throughout the year.

Uses — Once recorded as used for the making of matches.

Notes — 1. Fieldnotes. Tree 10–30 m. Bark usually blackish brown, dippled or flaky, with large or small (quadrangular) flakes coming out; sometimes short, sharp, and steep buttresses recorded, or stem fluted. Outer bark 0.5–2 mm thick, inner bark 5–10 mm, white to red-brown, with (much) red sap. Flowers ochre-brown or brown-yellow, inside pale yellow or yellowish green, once recorded as slightly fragrant. Fruit globlose, brown, yellow-bronze, or orange-brown; mace yellow-orange or bright yellow; seed brown.

According to Trimen (l.c.: 434, sub *M. laurifolia*) "in old trees the stem and large branches emit short tufts of stout woody aereal roots."

Worthington 4733 records "mace detachable as in *M. fragrans*, not as in *M. laurifolia*", and on no. *4858* "mace not detachable." Whether the aril is detachable or not is of taxonomic significance within *M. dactyloides* and requires closer study.

I have got the impression from the collector's labels that the mature aril (mace) is yellow, not orange-red or red as in most other species of *Myristica*.

2. Deviating specimens. *Meijer 1483*, from Kandy District, somewhat deviates by its clearly raised tertiary venation (reticulation) on the lower leaf surface. Among a

large number of homogeneous specimens with fruit short ovoid-ellipsoid or globose, when dry 3–3.5 cm long, I have seen a few specimens which deviate by having conspicuously longer, more elongate fruit, 4–4.5 cm long, possibly also with a thicker pericarp (c. 4 mm), and containing larger (longer) seeds, 3–3.5 cm long. These obviously represent some separate taxonomic entity as yet not sufficiently defined; the specimens are: *Jayasinuriya 1022*, *Meijer & Magden 1302* (both from Ritigala Strict Nature Reserve), *Kostermans 27947* (Nuckles Mts), and *Waas 1046* (Kandy District; fruit immature and female fls.). The colour of the aril of the mature fruits (seeds) was recorded as reddish brown (*Jayasuriya 1022*), whereas I think that the smaller fruited specimens all have yellow arils (see above).

Myristica depressa W. J. de Wilde, *spec. nov.*

Myristica malaccensi, M. borneensi et *M. wyatt-smithii* affinis, in foliis infra tomento brevi dense velutino, perianthio masculo crasso carnoso anthesi in lobis 3 ad c. 3/4-plo vel ultra fisso, androecio brevi lato apice (subplano vel) impresso differt. — Typus: *S 39018* (L; iso K), Sarawak.

Tree 10–30(–40) m. *Twigs* terete, towards the apex moderately stout, 2–3 mm diam., at first with greyish(-brown) tomentum with hairs c. 0.1 mm or less, early glabrescent, grey-brown to blackish, sometimes yellowish, finely or coarsely striate; bark lower down dark brown or blackish, coarsely striate, sometimes flaking; no lenticels. *Leaves* membranous or thinly chartaceous, oblong to oblong-lanceolate, usually parallel-sided or sometimes broadest above the middle, top acute-acuminate, base short-cuneate or narrowly or broadly rounded, 15–30 by 4–9 cm; upper surface glabrous, drying olivaceous or pale brown, lower surface grey or grey-brown, with persistent dense but thin felty or arachnoid covering of low tomentum of intricate greyish brown hairs c. 0.1 mm or less, hardly to be felt with the finger (lens!); papillae not obvious; midrib above flat to moderately raised; nerves 16–23 pairs, flat to sunken above, sometimes indistinct, at an angle of 45–80° with the midrib; venation usually faint on both surfaces (rather distinct, trabeculate in *Zainal Abidih 23*, from Nunukan I.); marginal arches distinct or not; petiole 10–25 by 1.5–3 mm; leaf bud 10–15 by 1.5–3 mm, with dense greyish to bright brown tomentum with hairs 0.1(–0.2) mm. *Inflorescences* essentially paniculate, rather slender, pubescent with rather woolly grey-brown or yellowish brown hairs 0.1–0.3 mm; in male: 2–3.5 cm long, common peduncle 5–10 mm, slightly flattened, first laterals (sub)opposite, up to 5 mm long, central branch 20–30 mm long, with 2–4 sessile laterals, the flowers in subumbels of 4–8, of strongly different age and size; bracts broadly rounded, 1.5–2 mm, pubescent, caducous; *female inflorescences* as males but smaller. *Male flowers:* with persistent tomentum of rather woolly (pale) brown hairs (0.1–)0.2 (–0.3) mm; pedicel 3–3.5 mm, perianth ovoid to ellipsoid, the top rounded or subacute, not or but faintly angular in transverse section, 3–4 by 2.5–3 mm, valves 3, rather carnose, at sutures (0.5–)0.7–0.8 mm thick, at anthesis splitting the perianth for 3/4–4/5, slightly out-curved; bracteole broadly ovoid to circular, often faintly 2-topped, c. 2 mm long; androecium short and broad, somewhat club-shaped, c. 1.5 by 1.2 mm; synandrium broadly ellipsoid, 1–1.3 by 1–1.2 mm, top truncate, sterile apex absent, the top ± hollowed out to 0.3 mm, 6–8(–10)-ribbed and lobed corre-

sponding with the anthers; anthers 6–8(–10), lateral, not tightly contiguous, c. 1 mm long; androphore broad-cylindrical, 0.3–0.5 by 0.8 mm, very minutely pale pubescent (apparently glabrous in immature flowers of *bb 27505* from Sumatra). Mature *female flowers* not seen. *Fruits* 1 or 2 per infructescence (which is 0.5–2 cm long), broad-ellipsoid to ellipsoid-oblong, 5–7 by 3–4.5 cm, top and base broadly rounded, pericarp (dry) (2–)3–6(–10) mm thick, with dense scurfy rusty to dark brown or grey-brown tomentum of hairs 0.1(–0.2) mm; seed ellipsoid, 4–5 cm long; fruit stalk stoutish, roughly fissured or cracked, 3–5 mm long.

Distribution — Malesia: Malay Peninsula, Sumatra, Borneo. — Collections: Sumatra, Indragiri: *bb 27505* (= *Buwalda 86*), *Buwalda 6619, 6718*; Riouw: *bb 27505*; Palembang: *Kostermans s.n.* (L) (deviating, see note 3). — Malay Peninsula (Pahang, Johore): *FRI 7875, 8160.* — Borneo. Sarawak: Asah, *Kuching Arb. no. 1248*; *S 19871, 21496, 26214, 37894, 39018*; Sabah (Beaufort District): *SAN 36758, 72125*; NE Kalimantan (Nunukan I.): *Zainal Ibidih 23.*

Ecology — Primary mixed Dipterocarp forest, on various soil types: occasionally inundated riverbanks, sandstone and diorite screes, hillsides, stony soils, yellow loamy soil; 0–300 m altitude. Fl. & fr throughout the year.

Notes — 1. Fieldnotes. Recorded with as well as without buttresses and stilt roots. Bole straight; outer bark brittle, fissured or flaky, blackish; inner bark brownish; sapwood white or brownish. Twigs blackish. Flowers yellowish grey or yellowish; fruit fawn, light brown, or apricot, aril pink.

2. A fairly homogeneous species apparently in close vicinity of species like *M. malaccensis*, *M. borneensis*, and *M. wyatt-smithii*, but quite distinct by its persistent, dense but short and inconspicuous tomentum on the lower leaf surface. This tomentum is easily seen with magnification. It resembles much the dense and short tomentum as to be seen on the older leaves of *M. cinnamomea*, a species with similar fruit, but generally with smaller leaves and quite differently angular-shaped male flowers with quite different slender androecium with a distinct sterile apex. The present species has the androecium singularly short and broad, resembling that of *M. borneensis* and especially that of *M. malaccensis*, the latter also devoid of a sterile apex; in *M. depressa* the top of the short and broad synandrium is broadly truncate, and shallowly hollowed in the centre, with the rather spaced anthers laterally. The fruits and male flowers of *M. malaccensis* are glabrous (early glabrescent), the latter at anthesis cleft by the lobes to only 1/3, its fruits glabrescent. *Myristica borneensis,* with fruits similar to those of the present species, differs by, besides the absence of a dense tomentum on the lower leaf surface, the male flowers which are less deeply cleft (to about halfway) and the androecium with a short and broad sterile apex.

Also related apparently are *M. agusanensis* (Philippines) and *M. guatteriifolia*, both with persistent tomentum on the lower leaf surface, and both with the androecium hollowed at the top.

3. The tertiary venation of the leaves of *Zainal Abidin 23*, from Nunukan I. (NE Kalimantan) is rather pronounced trabeculate, and well visible. This was one of the few specimens (immature male flowers) seen by Sinclair, and it was filed by him under *M. maxima.*

Kostermans s.n. (L), from Palembang, Tjaban F. R. near Muara Enim, somewhat deviates: the leaves have a more brownish drying colour above, with the nerves indis-

tinct, the leaf base conspicuously acute-attenuate, and the fruit (almost mature) smallish, only c. 4.5 cm long when dry. The specimen may represent a separate taxon.

4. Because of the pubescent lower leaf surface, small leaved sterile and fruiting specimens may be confused with *M. cinnamomea*.

5. Some older collections were determined by Sinclair as *M. malaccensis*.

Myristica devogelii W.J. de Wilde, *spec. nov.*

Myristica impressa affinis, in ramulis foliisque statura crassiore, foliis coreaceis glabris brunneis in sicco nec infra albidis, fructu maiore subgloboso c. 5 cm diam., pericarpio 8–10 mm crasso in sicco differt. — Typus: *de Vogel 6083* (L), Central Sulawesi, N side Lake Matano.

Tree 20 m tall. *Twigs* stoutish, subterete, towards the apex 4–5 mm diam., at first with minute rusty or greyish tomentum with hairs less than 0.1 mm, early glabrescent, bark dark brown, finely striate; bark of twigs lower down coarsely striate and somewhat fissured, lenticels small, not contrasting. *Leaves* coriaceous; blade oblong or oblong(-lanceolate), ± parallel-sided or broadest at or somewhat below the middle, 20–30 by 6–10 cm, base short-cuneate or nearly rounded, top acute or subacute-acuminate, or bluntish, upper surface drying bright brown or olivaceous, ± dull, lower surface glabrous (early glabrescent), brown, not contrasting, without minute points, without scattered non-traumatic dots; midrib above flat, nerves (12–)15–20 per side, at an angle of (45–)60° with the midrib, slender, flat and faint above, rather faint below, lines of interarching indistinct, tertiary veining faint or invisible on both surfaces; petiole 15–20 by 5 mm; sterile terminal leaf bud stoutish, acute, 15–20 by 4–5 mm, with dense tomentum of minute scale-like grey(-brown) hairs less than 0.1 mm. *Inflorescences* of the *Knema*-type, i.e. a sessile scar-covered wart-like brachyblast 3–5 mm diam., in female plants with 1–3 small flowers or 1 or 2 flowers together with a submature fruit; inflorescences shortly rusty-greyish pubescent, bracts small, caducous. Flowers shortly appressed pubescent with brown hairs c. 0.1 mm. *Male inflorescences* and *flowers* not seen. *Female flower:* pedicel short, less than 0.5 mm; bracteole (sub)persistent, ± saucer-shaped, c. 1.5 mm; perianth ± ovoid, c. 5 by 3 mm, lobes not seen; ovary ovoid, 3–3.5 by 2.5 mm, densely rusty appressed-pubescent with hairs 0.1(–0.2) mm, stigma minute, 2-lobed. *Fruit* mostly solitary, situated in-between the leaves or below the leaves, sessile, subglobose, (4–)5 cm diam., pericarp (dry) woody (6–)8–10 mm thick, with scurfy rusty tomentum with hairs 0.1 mm or less; mature seed not seen.

Distribution — Central Sulawesi, N side Lake Matano. — Collections: *deVogel 6083, 6298.*

Ecology — Forest on alluvial flat on conglomeratic soil and on ultrabasic bedrock; 400–450 m altitude. Fl. & fr. June, July.

Notes — 1. Fieldnotes. Straight tree, bole with or without buttresses, once prop-roots recorded, to 1.20 m out. Bark fissured, not peeling off. Exudate red watery and gum-like.

2. Readily distinct by its glabrous, coriaceous leaves and sessile globose fruit c. 5 cm in diameter.

Myristica elliptica Wall. ex Hook. f. & Thomson, Fl. Ind. 1 (1855) 162.

[Synonyms: *M. calocarpa* Miq., *M. sycocarpa* Miq.]

Wide-spread in West Malesia. Furthermore only known from Peninsular Thailand.

A recent collection from the Philippines, *Barbon c.s. PPI 12282*, from Quezon, Luzon, in fruit, may represent this species. It would be its first record for the Philippines. The specimen deviates by thin leaf blades. Additional material is needed to establish its definite position. It keys out beside *M. simiarum*, with which it is closely related.

Myristica extensa W. J. de Wilde, *spec. nov.*

Myristica inerti similis, sed habitu crassiore. Inflorescentiae masculae 10–15 cm longae. Perianthium masculum 4(–4.5) mm longum, androecio clavato, androphoro glabro synandrio breviore. Fructus breviter furfuracee pubescens. — Typus: *Ilias Paie S 25678* (L; iso K; E, SING, n.v.), Sarawak.

Tree 15–25 m. *Twigs* stoutish, towards the apex subterete to angular, 2.5–5 mm diam., drying yellowish brown to blackish brown, at first with palish hairs 0.1 mm or less, very early glabrescent, striate or not, twigs lower down with bark irregularly (longitudinally) cracking; lenticels few and indistinct, or absent. *Leaves* membranous to thinly chartaceous, elliptic-oblong to oblong(-lanceolate), broadest often somewhat above the middle, (16–)24–35 by (5–)8–13.5 cm, top acute-acuminate, base attenuate or acute, or usually narrowly rounded; upper surface drying (dullish) olivaceous to bright brown, glabrous, lower surface somewhat paler, grey-brown, glabrous but in not too old leaves with a minute, flat-lying open cobweb-like silvery covering (apparently related with the indument), papillae not obvious; midrib above rather broad, flat; nerves 16–24 pairs, at an angle of (45–)60–80° with the midrib, slender, indistinct and flat or ± sunken above, much raised beneath; marginal arches not distinct; tertiary venation usually indistinct on both surfaces; petiole 15–30 by 2.5–5 mm; leaf bud 10–15 by 2.5–3 mm, densely grey-brown or brown pubescent with appressed hairs c. 0.1 mm. *Inflorescences* slenderly built, almost glabrous with scattered greyish hairs 0.1 mm or less only; in male: widely paniculate, 10–15 by 6–10 cm, peduncle 20–45 mm, somewhat flattened, rather slender, first laterals subopposite, 10–35 mm long, central branch with 3 or 4 laterals, the lowest to c. 15 mm long; flowers in subumbels of 5–10, of strongly varying age and size; bracts caducous, not seen, their scars usually considerably dislocated upwards along the laterals; *female inflorescences* (seen in infructescences) smaller and fewer flowered as compared to the male, (1.5–)5–8 cm long, including 30–40 mm long peduncle. *Male flowers:* membranous, thinly grey-brown pubescent with hairs 0.1(–0.2) mm; pedicel slender, 9–12 mm long; bracteole persistent, broadly rounded-reniform, 2–2.5 mm long; mature perianth in bud ovoid, 4(–4.5) by 3–3.5 mm, top narrowly, base broadly rounded, valves 3, at anthesis splitting the perianth to nearly 2/3, the valves suberect, in bud not rendering the perianth angular; androecium rather short, club-shaped, 3–3.5 by 1–1.2 mm, synandrium ellipsoid to ellipsoid-oblong, c. 2 by 1.2 mm, anthers rather spaced, c. 8, sterile apex short, 0.2–0.3 mm, bluntish, androphore somewhat tapering, c. 1 by 1 mm, glabrous. *Female flowers* not seen. *Fruit* 1 or 2 per infructescence, (elliptic-)oblong, rounded at both ends, (when dry) 6–7 by

3–3.5 cm, pericarp dull brown, densely pubescent with minute scurf with hairs 0.1 mm or less, dry pericarp 3–6 mm thick, mature seed 5–5.5 cm long; fruit stalk 6–15 mm long.

Distribution — Borneo: Sarawak, C & E Kalimantan, Brunei. — Collections: Borneo. Sarawak: *S 25678, 27113, 33759, 33907, 36157.* C & E Kalimantan: *Hallier 2851*; *Kostermans 10450.* Brunei: *Wong WKM 1666.*

Ecology — Primary lowland forest; at top of spur, steep slope, hill forest near summit, undulating land. Rich clayey loam, sandy yellow loam (along rivulet), yellow clayey soil; 0–800 m altitude. Fl. June; fr. mainly March, Aug., Sept.

Notes — 1. Fieldnotes. Medium sized tree; recorded as without buttresses, also as with stem fluted or with spreading buttresses, or with stilt roots c. 80 cm high, c. 80 cm extending over the ground. Branching monopodial. Bark smooth or scaly, hard, c. 1 mm thick, cracked, grey, brown or blackish, at base of bole peeling off in strips, brittle. Living bark c. 5(–10) mm, brown. Wood brown. Recorded as with blood-red or pink sap in timber and bark, once as without red sap. Leaves below glaucous or whitish. Flower (buds) yellowish green. Fruit cream or yellow (*S 16416, 42356*, glabrous-fruited specimens, see note 3), greenish brown, or yellowish brown, with short brown tomentum; aril orange-red or red; seed blackish.

2. Closely related to *M. iners* and *M. corticata* because of similarities in the leaves and inflorescences, and to *M. malaccensis* because of its resembling structure of the androecium, which is ± club-shaped. By Sinclair some collections were identified as aberrant specimens of *M. maxima*, a species which is indeed very much resembling the present species and related as well, possibly even its closest relative. *Myristica maxima* also has widely branched paniculate inflorescences (and infructescences), but differs by a stouter habit (twigs, leaves, flowers), larger leaves with more pairs of lateral veins, a more distinct tertiary venation (reticulation), a usually well-marked arching marginal nerve, lower leaf surface paler greyish with (in not too old leaves) rather dense tomentum of very minute pale brown scale-like hairs (glabrescent) and generally rather distinct papillation. Its male flowers are larger, with the androecium cylindrical, not club-shaped, and with some tomentum on the androphore. For differences with other named related species, see the keys. Fruiting specimens may resemble *M. frugifera* from the Philippines.

3. Deviating specimens. Three specimens from Sarawak and Sabah come close to the present species, because of the similar general habit, and the leaves with almost the same appearance of the lower surface as seen with strong (×60) magnification. All three are in fruit: *S 16416* (identified by Sinclair as *M. malaccensis*), *S 42356* (collected after Sinclair's time), and *SAN 16808* (named by Sinclair *M. maxima*). They differ from *M. extensa* by a more greyish lower leaf surface, and particularly by glabrous fruit (glabrescent, with some remnants of very minute tomentum to be seen near the insertion of the fruit stalk in *S 16416*), with thick pericarp, when dry c. 10 mm thick. On the herbarium labels the fruit is described as: large, smooth, yellow (*S 16416*) and oblong, cream, pericarp 2.2 cm (*S 42356*). The tomentum on the terminal leaf bud is very short. Probably the three specimens mentioned above represent a separate yet undescribed species, which would key out in the key to fruiting specimens besides *M. iners* and *M. wyatt-smithii*, but the general aspect of the specimens is different. More material, including flowers, is needed to solve this problem.

Myristica fallax Warb., Mon. Myrist. (1897) 410.

This species was included by Sinclair (1968: 177) in *M. iners* Blume, but here it is reinstated as a more slenderly built species of its own, beside and closely related to *M. iners*. I have not seen the type specimen, *Beccari 1590* (FI), originating from Mt. Mattang, Sarawak.

Myristica fatua Houtt., Nat. Hist. Plant. 2, 3 (1774) 337; Miq., Ann. Mus. Lugd.-Bat. 1, 2 (1864) 205, p.p., incl. var. *macrocarpa*.

This species essentially is East Malesian, but one collection from SE Kalimantan, *Kuswata 886*, with male flowers, can be reckoned to this species.

subsp. **fatua**

[Synonyms: *M. macrophylla* Roxb., *M. mascula* Reinw. ex de Vriese, *M. plumeriifolia* Elmer, *M. spadicea* Blume, *M. tomentosa* Thunb.]

subsp. **affinis** (Warb.) W.J. de Wilde, *stat. nov.*

Myristica affinis Warb., Mon. Myrist. (1897) 422 — *Myristica fatua* Houtt. var. *affinis* (Warb.) J. Sinclair, Gard. Bull. Sing. 23 (1968) 275, f. 31. — Syntypes: *de Vriese s.n.* (K, L, S); *Beccari FI 7668, 7668a* (cult. Bogor) ((anno 1876; n.v.); *Treub s.n.* (cult.; B, lost).
Myristica celebica Gand., Bull. Soc. Bot. France 66 (1919) 225 (non *M. celebica* Miq., 1865).

Myristica fissurata W.J. de Wilde, Blumea 35 (1990) 243.

Myristica fragrans Houtt., Nat. Hist. Plant. 2, 3 (1774) 333.

[Synonyms: *M. amboinensis* Gand., *M. aromatica* Lam., *M. laurella* Gand., *M. moschata* Thunb., *M. officinalis* L. f., *M. philippinensis* Gand.]

Myristica frugifera W.J. de Wilde, *spec. nov.*

Arbor statura mediocri ramis crassis *Myristica maxima* et *M. philippensis* affinis. Gemmae terminalis tomentum breve pilis 0.1–0.2 mm tantum longis. Folia olivacea ad clare brunnea in sicco. Inflorescentiae foemineae (infructescentiae) paniculatae. Fructus ellipsoideus 5–6 cm longus in sicco tomento persistenti clare brunneo furfuraceo pilis 0.1–0.2 mm longis. — Typus: *Ridsdale 1219* (L; iso PNH), Philippines, Mindoro.

Tree 10–20 m. *Twigs* stout, towards the apex 4–6 mm diam., subterete or slightly angled, at first with minute grey-brown tomentum with hairs c. 0.1 mm, glabrous or very early glabrescent, smooth or finely longitudinally striate, brown to blackish brown; bark of twigs lower down coarsely longitudinally striate, sometimes ± cracking and flaking, grey-brown, with small and inconspicuous lenticels. *Leaves* elliptic (-oblong) to oblong-lanceolate, broadest usually at about or below the middle, chartaceous or thinly coriaceous, 18–30(–35) by 6–11(–13) cm, top subacute or shortly acute-acuminate, base attenuate or usually rounded or cordate; upper surface glabrous, drying olivaceous(-brown) or bright brown, lower surface drying grey or grey-brown with tomentum ± persistent or (late) glabrescent, the tomentum sparse

with scattered grey and grey-brown very minute scale-like hairs c. 0.1 mm and less; papillation distinct; midrib above rather broad, flat; nerves (20–)23–30 pairs, at an angle of (45–)60–80° with the midrib, very slender, faint, flat or slightly sunken above; marginal arches well-visible or indistinct; tertiary venation coarse but little visible; petioles 15–30 by 3–4 mm; terminal leaf bud 12–18 by 4–5 mm, densely grey or grey-brown pubescent with hairs 0.1–0.2(–0.5) mm. *Male inflorescences* and *male* and *female flowers* not seen. *Female inflorescences* only known from infructescences: glabrous (early glabrescent), essentially paniculate, subsessile or peduncled, 1–8 cm long, situated in-between the leaves, sometimes ± crowded in somewhat condensed short-shoot-like twigs, forming compound infructescences of 3 or 4 partial infructescences, always terminating in a sterile leaf bud; common peduncle (3–)5–50 mm; first laterals opposite, up to 10 mm long, central branch up to 20 mm long. Fruits 1–3 per infructescence, broadly ellipsoid to ellipsoid-oblong, 5–7.2 by 3–4.5 cm, base and top rounded, pericarp (dry) 5–8 mm thick, with persistent bright light brown to dark brown scurfy pubescence with hairs c. 0.1 mm, when old partially glabrescent; seed ellipsoid to ellipsoid-oblong, 4.5–5 cm long.

Distribution — Philippines: Luzon, Leyte, Mindoro. — Collections: *Ridsdale 803, 1175, 1219*; *Rosenbluth FB 12783*; *Sinclair & Edaño 9595*.

Ecology — Understorey tree of primary and disturbed lowland forest: 0–200 m altitude. Fr. Feb., June.

Notes — 1. Fieldnotes. Leaves above medium green, slightly glossy with paler midrib and veins, beneath pale green or glaucous with yellowish green midrib and veins. Not yet ripe fruit recorded as glabrous. Ripe fruit brown.

2. The material of the present new species is rather heterogeneous, according to the islands of provenance. The specimen from Luzon, *Sinclair & Edaño 9595*, is sterile in L, but immature fruit is recorded as glabrous. It has olivaceous-brown leaves, drying grey beneath, with 25–30 pairs of nerves, and links up very well with the collection from Leyte, *Rosenbluth FB 12783* (immature fruit). The three collections from Mindoro, *Ridsdale 803, 1175, 1219* (type), all in fruit, are mutually almost identical and differ somewhat from the other two specimens mentioned by the twigs drying rather brown instead of blackish brown, rather bright brown subcoriaceous leaves with fewer (20–25) pairs of nerves. The infructescences are either subsessile (e.g. *Ridsdale 803*, in part) or up to 5 cm peduncled (*Ridsdale 1175*).

3. *Myristica frugifera* obviously is closely related to *M. maxima* from West Malesia, and *M. philippensis* from the Philippines. *Sinclair & Edaño 9595* and *Rosenbluth FB 12783* were identified by Sinclair as *M. philippensis*, a species quite different by its roughly pubescent terminal leaf bud, with hairs 1(–2) mm long. *Myristica maxima* differs in a number of details, including a much denser tomentum on the lower leaf surface and a generally blackish drying colour of the leaves, rendering this species with a different general appearance. Also *Myristica extensa* (Borneo) presumably is related, but it should be noted that flowers of the present new species are not known.

Myristica gigantea King, Ann. Roy. Bot. Gard. Calc. 3 (1891) 288.

[Synonym: *M. motleyi* Warb., nom. nud., p.p.]

Myristica guatteriifolia A.DC., Ann. Sc. Bot. 4, 4 (1855) 20.

[Synonyms: *M. cookii* Warb., *M. litoralis* Miq., *M. palawanensis* Merr., *M. riedelii* Warb.]

I have not seen specimens myself from continental Southeast Asia. According to Sinclair (1968: 213–218) it occurs in Burma and Vietnam (only known from Condor Is., the type of *M. cookii*); most likely it occurs in Thailand, but I do not know of any specimens collected.

Myristica impressa Warb., Mon. Myrist. (1897) 537.

This species was treated by Sinclair (1968: 235, 481) as excluded or doubtful, but has been reinstated by me. In the regional key to the species of Sulawesi the following specimen provisionally keys out here: *Kjellberg 2990* (S; duplicate in BO, n.v.), a fruiting collection from Todjamboe, C (SW) Sulawesi, at c. 300 m altitude, which likely represents a new species. It resembles *M. impressa* Warb., but differs by a more tiny habit, with smaller leaves which are not whitish below as in that species. The specimen also resembles the variable *M. cumingii* Warb. from the Philippines, but I think that it is not identical with that species. More similar material from Central Sulawesi is needed to reach a more definite opinion.

Myristica impressinervia J. Sinclair, Gard. Bull. Sing. 23 (1968) 232.

Myristica iners Blume, Bijdr. 2, 11 (1826) 575.

[Synonyms: *M. cumingii* Warb. var. *floribunda* Airy Shaw, *M. heritieriifolia* Pierre ex Lecomte, *M. sublanceolata* Miq., *M. vordermanii* Warb.]

According to Sinclair (1968: 179) known for the continental Southeast Asian area from South Vietnam, Cambodia and SE and Peninsular Thailand. I myself have seen one specimen from Cambodia (*Béjaud 122*, K) and several from Thailand, but apparently the species does not occur frequently.

Beside the normal form, variable and widespread in West Malesia, there are a number of specimens of an exceptionally stout form, mainly from NE Borneo, characterized by stouter habit and the tomentum of the sterile terminal leaf bud with comparatively long hairs; this form is as yet not formally recognized.

The collection *Wenzel 3537* (K) from the Philippines, Surigao (Mindanao) comes very near specimens of *M. iners* with rather long hairs on the sterile terminal leaf bud and with comparatively long and slender fruiting pedicel. The Surigao specimen deviates by a rather distinct fine punctation on the lower leaf surface (lens!) and is curious because of its provenance, rather at a wide distance from the main area of distribution in Borneo and more to the West. The specimen is with immature fruit, and more collections from the region are needed to establish the true status of this plant.

Myristica insipida R.Br., Prod. Fl. N. Holl. ed. 1 (1810) 400.

[Synonyms: *M. cimicifera* Soland. ex R.Br., *M. cimicifera* R.Br. var. *acutiflora* Warb. & var. *insipida* (R.Br.) Warb., *M. macgregorii* Warb.]

Myristica inutilis Rich. ex A. Gray

subsp. **papuana** (Markgr.) W.J. de Wilde var. **papuana**; W.J. de Wilde, Blumea 40 (1995) 293–294.

[Basionym: *Myristica fatua* Houtt. var. *papuana* Markgr.]

[Synonym: *M. wallaceana* Warb., Mon. Myrist. (1897) 530, t. 19. — Type: *Beccari FI Acc. nos. 7707, 7707A, 7707B* (FI, n.v.); *Warburg 20721* (B, lost).

Specimens seen: Aru Is. (Palau Wokam): *bb 25263* (L, sterile); *Buwalda 4918* (L, female fl.).

Keys out beside *M. fatua*; distinct by smaller leaves (drying dark brown above) and smaller flowers.

Myristica kjellbergii W.J. de Wilde, *spec. nov.*

Myristica koordersii affinis, in folii pagina superiore nervis maxime inconspicuis, fructu subsessili globoso c. 2 cm diam., pericarpio tenui (c. 2 mm) differt. — Typus: *Kjellberg 2962* (S; iso BO), SW Sulawesi, Todjamboe.

Tree 4–15 m. *Twigs* terete, towards the apex 2.5–3 mm diam., very finely striate or not, at first with dull minute tomentum with hairs c. 0.1 mm, rather late glabrescent, twigs lower down dark brown, 4–5 mm diam., more coarsely striate, with scattered not much contrasting lenticels. *Leaves* chartaceous to subcoriaceous, broadly ellipsoid-oblong, broadest at or above the middle or distinctly parallelsided, 15–24 by 5–10 cm, base attenuate(-acute), top short acute-acuminate; upper surface drying dark (bright) brown to blackish brown, dull, lower surface subglabrous or glabrous, i.e. at first with grey-brown tomentum of interwoven, soft, stellate hairs 0.1–0.2 mm, glabrescent, the larger hairs leaving minute point-like hair scars, dull greyish with papillae distinct or not; midrib flat or but slightly raised above, nerves 10–16 pairs, at an angle of 45–60° with the midrib, above very slender, flat or slightly sunken and hence indistinct, on lower surface dark bright purple-brown, much contrasting with the lower leaf surface; marginal arches indistinct, tertiary venation fine, indistinct; petiole 10–15 by 3–4 mm; leaf bud c. 15 by 3 mm, densely rather woolly pubescent with dull rusty or grey brown hairs 0.2–0.5 mm. *Male flowers* not known; *female inflorescences* of the *Knema*-type, i.e. small wart-like tubercles 2–3 mm long, sessile, finely woolly pubescent, bearing 2–5 flowers almost of the same size and age. *Female flowers* (*Meijer 9363*): densely bright golden rusty pubescent with hairs c. 0.2 mm, subsessile, pedicel c. 0.5 mm; perianth in bud ovoid, narrowed towards the apex, c. 5.5 by 3.5(–4) mm, base broadly rounded, top narrowly rounded to subacute, not angular in cross section; valves 3 or 4, splitting the perianth in anthesis to c. 1/3 to nearly halfway, out-curved, at sutures c. 0.3 mm thick; bracteole ovate, persistent, c. 3 mm, clasping the perianth; ovary ovoid, incl. small 2-lobed stigma c. 3 by 2 mm, densely goldenbrown pubescent with hairs 0.2(–0.3) mm. *Fruit* in small sessile clusters of c. 2 per infructescence, subsessile, (sub)globose, the top rounded, without or with small, slender, acute, 1.5(–2) mm long beak, base broadly rounded, 20–22 by 20 mm, pericarp densely rusty pubescent with hairs 0.1–0.2 mm, when dry woody-pergamentaceous, 1–2 mm thick; fruit stalk 1–1.5 mm long; seed ellipsoid, 16–18 mm long, with thick aril.

Distribution — Known only from the type, from SW Sulawesi, and additional collections from C Sulawesi; deviating collections discussed in the notes. — Collections: SW Peninsula, Todjamboe, *Kjellberg 2962*; Central (W of Tongoa), *Johansson, Nybom & Riebe 206*; between Palu and Parigi, *Meijer 9363*; N Sulawesi, Dumoga Bone Nat. Park (Gorontalo District), *Milliken 935* (K, female fl., fr.).

Ecology — Primary rain forest, at 500–800 m altitude. Fr. Mar., Aug., Dec.; female fl. Apr., Aug.

Notes — 1. Fieldnotes. Low tree, 4–15 m tall. Branches horizontal, 3–5 from the same spot. Bark dark grey-brown, finely flaking. Leaves silvery white beneath. Fruit yellow or brown felty, or rusty brown; spherical, c. 2.5 cm diam.; aril red.

2. The specimen which serves as the type of the present new species was placed by Sinclair in *M. koordersii*, a species regarded by him as wide-spread in Sulawesi.

3. The present species has a pale, greyish or whitish undersurface of the leaves, with the bright brown nerves conspicuously contrasting, a feature which it more or less shares with *M. koordersii*, *M. impressa*, and *M. impressinervia*; it differs, however, from the first two species by its extremely faint nerves on the upper leaf surface, by the presence of papillae (always?), and by smaller fruit with (when dry) thin pericarp.

Myristica impressa Warb. was regarded as a dubious name by Sinclair, but is now reinstated as a species beside *M. koordersii*. This cannot be the present species because Warburg described and figured it with larger fruit with a much thicker pericarp. *Myristica impressinervia*, known only with male flowers, has a much more tiny general habit, with smaller and thinner leaves, without apparent papillae beneath; its male inflorescences are distinctly peduncled.

4. The specimen *Ramlanto & Zainal Fanani 730*, from Mt Tinombala (W Minahasa) might belong here; it differs by the leaves which are more glossy above, and the rather ellipsoid fruit nearly 3 cm long. It is possible that it represents a taxon of its own.

Teijsmann 11722, 12118, 14063, in fruit or sterile, from southern SW Peninsula, cited by Sinclair (1968: 264) under *M. koordersii*, possibly belong to the present *M. kjellbergii*. The specimens have smallish subglobose fruit, but vegetatively (leaves) they rather link up with specimens of *M. impressa*; possibly the fruits, preserved in a poor condition, have suffered some disease, and are atypical. More material is needed to solve these problems.

Myristica koordersii Warb., Mon. Myrist. (1897) 619.

Myristica laevis W. J. de Wilde, *spec. nov.*

Folia lanceolata 9–22 cm longa 2–4.5 cm lata, infra papillosa nervis lateralibus in 20–30 paribus infra planis inconspicuisque. Inflorescentiae contractae paniculatae. Perianthium masculum ellipsoideum in alabastro 6–6.5 mm longum c. 4 mm latum crasse ligneo-coriaceum anthesi ad ultra medium fissum; androecium breviter cylindricum; antherae 8 vel 9; androphorum breve c. 0.2 mm longum sparse pubescens. Fructus subglobosus ad ellipsoideus 4–5.5 cm longus, pericarpium 8–10 mm crassum minute pubescens. — Typus: *Gutierrez (1114) PNH 118091* (L; iso PNH, n.v.), E Philippines, Samar I.

Tree 4–20 m tall. *Twigs* towards the apex subterete, 2–3 mm diam., dark brown or blackish brown, smooth or striate, at first with minute dull brown tomentum with hairs 0.1 mm or less, early glabrescent, bark of twigs lower down dark brown or rather palish, coarsely striate, lenticels only locally or indistinct or absent. *Leaves* thinly chartaceous, lanceolate, 9–22 by 2–4.5 cm, ± parallel-sided, top acute(-acuminate) or bluntish, base cuneate to nearly rounded; upper surface drying dull olivaceous-brown to dark brown, lower surface glabrous (early glabrescent), pale dull brown or greyish, papillose; midrib above narrow, flat, on lower surface slender, much raised, drying light yellow-brown, lateral nerves 20–30 pairs, at an angle of 60–80° with the midrib, flat or sunken, hardly visible above, on lower surface flat or but slightly raised, faint; tertiary venation and marginal arches indistinct or invisible; petioles 10–20 by 1.5–2.5 mm; sterile terminal leaf bud not very slender, acute, 7–16 by 3–4 mm, densely dull brown pubescent with hairs 0.1–0.5 mm. *Inflorescences* condensed-paniculate, i.e. with a distinct common peduncle, ± flattened, smooth, without scars, ending in a subumbel of flowers of ± different age and size, but not forming a scar-covered short-shoot of longer duration; *male inflorescences* (described from the type *Gutierrez PNH 108091*): common peduncle 5–8 mm long, subumbel with 3–6(–10) flowers of varying age and size, bracts minute, caducous; *female inflorescences* similar as the males, the peduncle up to 25 mm long, fewer-flowered; inflorescences including flowers dark rusty pubescent with hairs 0.2–0.3 (–0.5) mm. *Male flowers:* pedicel stoutish, 5–7 mm long; bracteole broadly ovate, rounded, c. 4 mm long, caducous; mature perianth in bud conspicuously woody-coriaceous, ovoid to ellipsoid(-oblong), top narrowly rounded, base rounded, 6–6.5 by 4(–4.5) mm, valves 3, at sutures c. 0.8 mm thick, at anthesis splitting the perianth to over halfway (and possibly nearly to the base) (flowers in full anthesis not seen); androecium broadly cylindrical, short, 2.5–3 by 1 mm, synandrium short-cylindrical, 2–2.3 by 1 mm, anthers 8 or 9 (i.e. 16–18 thecae), contiguous, sterile apex bluntish, 0.2–0.4(–0.5) mm long; androphore short and broad, only c. 0.2 mm long, like a disk at the base of the synandrium, sparsely pubescent with erect pale brown hairs 0.1–0.2 mm. *Female flowers* not seen; pedicel variable of length (see the subspecies). *Fruit* single or up to 3 per infructescence; subglobose or ellipsoid, (3.6–)4–5.5 cm long; minutely pubescent with brown scurfy tomentum of hairs 0.1–0.2 mm; pericarp 7–10 mm thick; bark of peduncle of infructescence conspicuously longitudinally cracked; fruit stalk glabrous, variable of length (see the subspecies); mature seed not seen.

Distribution — E Philippines, two subspecies.

Note — This new species occupies an isolated position. With *Myristica umbellata* it has the distinct papillation on the lower leaf surface in common, as well as the pedunculate somewhat umbellate non-branched inflorescences, but as a whole that species is quite different. In the general appearance of the leaves the present species may recall some forms of *M. angusanensis* and *M. rubrinervis*. *Myristica laevis* is characterized by its glabrous, lanceolate, faintly but many-nerved leaves, by its large and more or less coriaceous male flowers with almost sessile synandrium, and by its fruits with very thick pericarp. Like some other *Myristica* species, its dry leaves are exceedingly brittle.

KEY TO THE SUBSPECIES

1a. Infructescences with peduncle 3–10 mm long; fruit stalk (female flower pedicel) 2–3 mm long; fruit subglobose, 3.8–4.2 cm long; tomentum of pericarp of cinnamon-rusty scurfy hairs c. 0.1 mm, rather easily rubbed off ... subsp. **laevis**

b. Fruiting peduncle 15–25(–30) mm long; fruit stalk (female flower pedicel) rather slender, 13–18 mm long, with the bracteole-scar 2–4 mm below the fruit; fruit (slightly immature) ellipsoid-oblong, 5–5.5 cm long, with persistent dark chocolate-coloured tomentum with hairs 0.1–0.2 mm .. subsp. **badia** W.J. de Wilde

subsp. **laevis**

Tree 4–20 m. *Male inflorescences* and flowers as described under the species. *Female flower* pedicel short. *Fruit* solitary, subglobose, 3.6–4.2 by 3.3–4 cm; pericarp 7–9 mm thick; tomentum cinnamon or rusty, rather easily rubbed off, composed of scurfy hairs c. 0.1 mm; peduncle of infructescence 3–10 mm long; the fruit stalk (grown-out female flower pedicel) 2–3 mm long.

Distribution — E Philippines: Samar I., Mt. Sohoton. — Collections: *Madulid (797) PNH 117776*; *Gutierrez (1114) PNH 118091.*

Ecology — Forest of Mt. Sohoton, altitude not recorded. Fl. & fr. Apr.

Note — Fieldnotes. Small tree 4–20 m, dbh 8–60 cm. Flowers yellow-green, (slightly immature) fruit brown.

subsp. **badia** W.J. de Wilde, *subspec. nov.*

A subspecie typica in pedunculo fructifero longo 15–25(–30) mm longo, pedicello fructifero longo 13–18 mm longo, fructu ellipsoideo 5–5.5 cm longo tomento persistenti furfuraceo atro-brunneo brevi pilis 0.1–0.2 mm longis differt. — Typus: *Rojo 159* (L), Philippines, Mindanao.

Tree c. 5 m tall. *Male flowers* not seen. *Fruit* 1–3 per infructescence, ellipsoid-oblong, top rounded with short apiculum, base rounded, (slightly immature) 5–5.5 by 3 cm, (dry) pericarp hard, c. 10 mm thick, with persistent dark chocolate scurfy tomentum with hairs 0.1–0.2 mm; peduncle of infructescence 15–25(–30) mm long; fruit stalk (grown-out female flower pedicel) rather slender, glabrous, 13–18 mm long, with the scar of the bracteole 2–4 mm below the fruit.

Distribution — E Philippines; only known from the type specimen from S Surigao, NE Mindanao.

Ecology — Hillside forest; 400 m altitude. Fr. Oct.–Nov.

Note — Fieldnotes. Low tree, 5 m tall, dbh c. 10 cm. Bark blackish. Twigs and leaves rather brittle. Wood relatively soft. Infructescences with the leaves, with one or usually three fruits per peduncle; fruits ovate, ferrugineous to chocolate brown hairy, with mucro at top and two shallow longitudinal depressions.

Myristica lancifolia Poir. in Lam., Encycl. Méth. Bot. Suppl. 4, 1 (= 12) (1816) 35.

subsp. **lancifolia**

subsp. **montana** (Roxb.) W.J. de Wilde, Blumea 35 (1990) 247.
[Basionym: *M. montana* Roxb.]
[Synonyms: *M. diversifolia* Miq., *M. lancifolia* Poir. var. *montana* (Roxb.) J. Sinclair.]

Myristica lepidota Blume, Rumphia 1 (1837) 183.

subsp. **montanoides** (Warb.) W.J. de Wilde, Blumea 35 (1990) 247.
[Basionym: *M. montanoides* Warb.]

Myristica longepetiolata W.J. de Wilde, *spec. nov.*

A *Myristica cumingii* per folias parviora laminas 10–15 cm longas glabras, petiolo comparate longo 20–30 mm longo, fructum subgloboso-ellipsoideum c. 5 cm longum in sicco, pericarpio c. 10 mm crasso tomento pilis minutis ferrugineis c. 0.1 mm longis distincta. — Typus: *Sulit (5354) PNH 21548* (L), Philippines, Biliran Is., northern slope of Mt Suiro.

Tree 17 m. *Twigs* medium, towards the apex 2–4 mm diam., drying faintly angular, yellowish brown or dark brown, at first with scattered minute greyish hairs less than 0.1 mm, early glabrescent; bark of twigs lower down coarsely striate, with scattered conspicuous lenticels. *Leaves* (thinly) chartaceous; leaf blades ellipsoid-oblong or oblong, 10–15 by 2.5–6 cm, base cuneate, top blunt or acutish or acute-acuminate, sometimes narrowed in the upper half of the blade; upper surface drying glossy, olivaceous or bright brown, lower surface brown or grey-brown, glabrous, not or indistinctly papillose; not dotted; midrib slender, flat or slightly raised above; nerves (10–)12–15 pairs, flat and faint above, at an angle of 45(–60)° with the midrib, lines of interarching not distinct, tertiary veining coarsely reticulate, not very distinct; petiole comparatively long, bright reddish or yellowish brown (of the same colour as the twigs), glabrous, 20–35 by 1.5–2 mm; sterile terminal leaf bud smallish, acute, c. 10 by 1.5–2 mm, with inconspicuous tomentum with appressed greyish or brown hairs 0.1 mm or less. *Inflorescences* known only from the *infructescences:* subsessile, with a common peduncle 1–2 mm long only, 1-fruited and with a few scars of abortive flowers. *Male* and *female flowers* not seen. *Fruit*: subglobose or broadly (ovoid-) ellipsoid, 5–6 by 4–4.5 cm, (dry) pericarp c. 10 mm thick, with dense dark-rusty tomentum with hairs c. 0.1(–0.2) mm; seed ellipsoid, 3.5–4 cm long.

Distribution — Philippines: Luzon (Sorsogon Prov.?, Camarines Prov.) and Biliran Is. — Collections: *Ramos BS 23322* (see note 3); *Alambra FB 27411*; *Sulit PNH 21548*.

Ecology — Sloping forest, c. 800 m altitude. Fr. Apr./May, July/Aug., Dec.

Notes — 1. Fieldnotes. Tree 17 m, dbh 50 cm. Fruit brown, large.

2. The subsessile infructescences with stoutish, short, 1–2 mm long common peduncle suggest that the male inflorescences may be (short) paniculate, with a more or less distinct common peduncle, suggesting an alliance with *M. agusanensis*. The latter species differs by its minute tomentum on the lower leaf surface, glabrescence, and its smaller fruit.

3. The specimen *Ramos BS 23322* (K) somewhat deviates by a paler drying colour of the lower leaf surface, which is rather papillose in young leaves; it is annotated as having fruit, but I did not see any.

4. The three collections belonging to the present species were by Sinclair (1968: 437) included in the Philippine material of his *M. ceylanica* var. *ceylanica*, now *M. cumingii* Warb.

Myristica lowiana King, Ann. Roy. Bot. Gard. Calc. 3 (1891) 293.
[Synonym: *M. hackenbergii* Diels.]

Myristica magnifica Bedd.

Myristica magnifica Bedd., Fl. Sylv. 2 (1872) 268, t. 268; Gamble, Manual Ind. Timbers (1881) 314; (ed. 1902 & 1922) 556; Hook. f., Fl. Brit. India 5 (1886) 104; King, Ann. Roy. Bot. Gard. Calc. 3 (1891) 291, pl. 119; Warb., Mon. Myrist. (1897) 424; Talbot, Syst. List Trees & Shrubs Bomb. Pres. ed. 2 (1902) 280; Cooke, Fl. Pres. Bomb. 2, 2 (1906) 531; Brandis, Indian Trees (ed. 1906 & 1911) 524; Talbot, For. Fl. Bomb. Pres. & Sind 2 (1911) 381; Gamble, Fl. Pres. Madras 2, 7 (1925) 1214; Krishna Moorthy, Ind. For. 86, 5 (May 1960) 314. — *Myristica fatua* Houtt. var. *magnifica* (Bedd.) J. Sinclair, Gard. Bull. Sing. 23 (1968) 282, f. 33. — Syntypes: all Beddome's specimens as cited by Sinclair, l.c.: 284.

Tree 10–35 m. *Twigs* stoutish, towards apex terete, drying bright brown or reddish brown, coarsely striate, 4–5(–10) mm diam., at first with dense rusty tomentum of hairs 0.5–1 mm long, glabrescent, bark of twigs lower down coarsely striate with a faint tendency to crack, with small indistinct lenticels. *Leaves* (thinly) coriaceous, elliptic-oblong to oblong-lanceolate, broadest at about the middle, 20–40(–60) by 6–17 cm, base broadly to narrowly rounded, top acutish or bluntish to acute-acuminate; upper surface drying olivaceous to olivaceous-brown, dull, lower surface with subpersistent aureous-brown felt-like tomentum of interwoven scale-like and dendroid hairs 0.3–0.5(–1) mm long, late glabrescent (old leaves); midrib flat to slightly raised above; nerves 16–27 pairs, at an angle of 60–70°, slender and faint, slightly sunken above, marginal arches not distinct; venation coarse, indistinct or invisible; papillae (older leaves) not apparent; petiole stoutish, at first with tomentum similar to that of the twig apices, glabrescent, (20–)25–50 by 3–6 mm, drying dark brown. *Inflorescences* of the *Knema*-type or almost so, pubescent with rusty shaggy hairs c. 1 mm; in male: 0.5–1.5 cm long; subsessile or usually with a slightly flattened common peduncle up to 5 mm long, and a simple or usually forked wart-like part c. 5 mm long, scar-covered, and at apex with a subumbel of 5–15(–20) flowers of various age; female inflorescences smaller, few-flowered. *Flowers* ± coriaceous, densely dark brown to rusty pubescent with hairs c. 1 mm; valves 3, splitting the perianth at anthesis to 1/4–1/3, the apex of the perianth not angular. *Male flowers:* pedicel stoutish, (3–)5–8 mm long; bracteole broadly ovate-orbicular, caducous, 4–5 mm long; mature perianth in bud ovoid-ellipsoid, 5–8 by 4–5 mm, top rounded, not angular, base broadly rounded; valves in anthesis suberect, at the sutures c. 0.5 mm thick; androecium comparatively small, cylindrical, c. 4(–4.2) by 0.8(–1) mm; synandrium cylindrical, top bluntish without or with very small sterile apex (less than 0.1 mm), base rather saccate, 2.5–3 by 0.8(–1) mm; anthers 8–10, contiguous; androphore shorter than the synandrium, cylindrical, c. (1–)1.5 by 0.7 mm, ± furrowed, glabrous in the upper 1/2–2/3, towards base densely hairy with rather rigid rusty hairs c. 0.5 mm long. *Female flowers* not seen. *Fruits* on subsessile inflorescences similar

to male inflorescence, solitary or in pairs, ovoid-oblong, top narrowly rounded, base broadly rounded, densely rusty to yellowish brown pubescent with hairs 1–1.5 mm, 4.5–5.5 by 2.5–3.5 cm, pericarp (dry) c. 4 mm thick; seed ovoid-oblong, c. 4.5 cm long; fruit stalk 2–5 mm long.

Distribution — S India (Peninsular India): Bombay Presidency, Kerala (for further details see Sinclair, l.c.: 284). — Collections (Kerala): *Kostermans 26091*; *Ridsdale 539*.

Ecology — Large tree, locally common in evergreen swamp forest; according to Moorthy the dominant tree in the '*Myristica* swamp association' which fringes sluggish streams in damp valleys of the Ghats. Lowland and foot hill (valley) forest, up to c. 1000 m altitude. Fl Feb.–March, fr. June–Aug. See further Sinclair, l.c.: 285.

Notes — 1. Fieldnotes. Large tree with stilt roots, and often with buttresses, some of the roots from the base (in marshy ground) spreading along the ground and rising in loops (pneumatophores) above the surface. Bark black, fissured, strips 5 mm wide and thick. Fresh fruit 7–10.5 cm long, seed c. 6 cm long. Bole straight. Leaves with brown indumentum below. Immature flowers brown. Fruit brown, aril orange-red.

2. According to Sinclair (l.c.: 285) to be regarded as a variety of the wide-spread *M. fatua*, with several more varieties in West and East Malesia. I prefer to keep this as a species of its own (though closely allied to *M. fatua*), chiefly on the characters used in the key, e.g., stouter habit, more elaborate and larger (longer) tomentum, and larger bracteole in male.

Sinclair (l.c.) enumerates a number of differences separating his var. *magnifica* from typical *M. fatua*, considering short male pedicels in var. *magnifica* possibly as a good character, but I found the male pedicels in the recent collection *Ridsdale 539* stout and as long as 5–8 mm, rendering the difference with typical var. *fatua* only smaller. A good distinguishing character, possibly unique in the genus, seems to be the conspicuous looped knee-roots or pneumatophores in the present species.

Myristica maingayi Hook. f., Fl. Brit. India 5 (1886) 104.

This species occurs in the Malay Peninsula and is known from Sumatra only by a slightly deviating collection, *Krukoff 4384*, from Sumatra's East Coast; it deviates by a slightly smaller fruit, with a spongy-woody pericarp, not distinctly wrinkling on drying.

The record from Peninsular Thailand, based on *Kerr 15014* (BM, K), was erroneously placed by Sinclair in *M. crassa* King.

Myristica malabarica Lam.

Myristica malabarica Lam., Hist. Acad. Roy. Sc. Paris (for the year 1788) (1791) 162; Encycl. Méth. Bot. 4 (1797) 388; Tab. Encycl. Illus. Gen. 2, 5 (1800) (excl. pl. 833 f. 2a–b = *M. dactyloides*); Hook. f. & Thomson, Fl. Ind. 1 (1855) 163; Bedd., Fl. Sylv. 2 (1872) t. 269; King, Ann. Roy. Bot. Gard. Calc. 3 (1891) 288, pl. 109; Warb., Mon. Myrist. (1897) 403, t. 12 f. 1–8 (excl. *M. heyneana* = *M. dactyloides* p.p.); J. Sinclair, Gard. Bull. Sing. 23 (1968) 168, f. 9. — For further literature see Sinclair, l.c. — Type: no type specimen preserved or quoted; based on pre-Linnean names, cited and discussed by Sinclair, l.c.: 169, 171, 174; figured in Rheede, Hort. Malab. 4 (1683) 9, t. 5, quoted inflor. masc. tantum.; see note 3.

Myristica dactyloides auct. non Gaertn.: Wall., Cat. (1832) no. 6786, nom. nud.

Myristica notha Wall., Cat. (1832) no. 6787, nom. nud.
Myristica tomentosa auct. non Thunb.: Graham, Cat. Pl. growing in Bombay and its vicinity (1839) 175, p.p. (the other part is *M. dactyloides*).

Tree 25–30 m, with stilt roots. *Twigs* slender, ± terete, striate, dark grey-brown, towards the apex 1.5–2 mm diam., lower down up to c. 4 mm diam., at first with rather sparse tomentum of appressed grey-brown hairs, 0.1–0.2 mm, glabrescent (glabrous), bark of twigs lower down coarsely striate with a tendency of longitudinally cracking; lenticels inconspicuous or absent. *Leaves* membranous, elliptic to oblong-lanceolate, broadest at about the middle, 6–12(–16) by 2–4(–4.5) cm, base rounded to short-cuneate, top bluntish to subacute (with blunt tip); upper surface drying olivaceous-brown, glabrous; lower surface dull greyish brown, at first with tomentum of minute hairs, glabrescent; midrib very slender, flat above; nerves 6–9 pairs, at an angle of 60–70° with the midrib, faint and flat or ± sunken above, faint and sunken or slightly raised beneath; marginal arches indistinct; venation forming a lax network, faint on both surfaces; petiole 7–10(–15) by 1–1.5 mm; leaf bud slender, 4–7 by 1 mm, densely appressed-pubescent with grey-brown hairs 0.1–0.2 mm. *Inflorescences* sometimes in leafy lateral short-shoots, paniculate, late glabrescent or with persistent inconspicuous, thin, tomentum composed of grey-brown hairs 0.1–0.2 mm long; in male: 2–6 cm long, laxly branched, peduncle slender, ± flattened, 10–25 mm long, 1–1.5 mm thick, laterals (2–)3–10 mm long, central branch up to 15 mm long; flowers terminally clustered in loose subumbels of 5–8 flowers, of different age. *Female inflorescences* (according to King and Sinclair) few-flowered, subsessile or up to c. 2 cm long. *Flowers* thinly pubescent with appressed greyish brown hairs 0.1–0.2 mm, late glabrescent; valves 3 or 4, splitting the bud for c. 1/3; bud at apex not angular. *Male flowers:* pedicel slender, 6–9 mm long; bracteole broadly reniform, 1–2 mm long, caducous; mature perianth in bud ovoid, (4–)4.5–5 by 3–3.5 mm, top narrowly rounded, not angular, base broadly rounded; valves in anthesis suberect, at sutures 0.2–0.3 mm thick; androecium narrowly conical, (3–)4 by 1(–1.2) mm; synandrium subcylindrical or somewhat conical, (2.5–)3 by 1(–1.2) mm, top subacute or bluntish with sterile apex c. 0.2 mm, entire, glabrous; anthers possibly 6 or 7, i.e. (10–)12–14 thecae (according to Sinclair 10–15 anthers), contiguous; androphore broad-cylindrical, c. 1 by 1–1.2 mm, entirely densely rusty-red shaggy hairy with hairs c. 0.5 mm. *Female flowers* (according to King and Sinclair) slightly larger than the male; pedicel 2–4 mm; ovary pubescent, style and stigma 2-lobed. *Fruit* single or 2 or 3 together, ovoid-oblong, bluntly pointed at apex, base rounded, up to 10 cm long and 4–6 cm broad when fresh, densely coarsely rusty-tomentose with hairs c. 1 mm long; seed 4–4.5 cm long; fruit stalk a few mm long.

Distribution — West Coast of Peninsular India, in the damp valleys at the foot of the Ghats (Bombay Presidency, Mysore, Kerala). — Collections: Mysore, Coorg, near Mercara: *Hohenacker 515*. Further collections cited by Sinclair, l.c.: 171.

Ecology — Evergreen swamp forest, to c. 350 m altitude. According to Krishna Moorthy (Indian For. 86, 5, May 1960: 314) a member of the '*Myristica* swamps' bordering sluggish streams; an excerpt of this article is given by Sinclair, l.c.: 172.

Uses — Formerly used as an adulterant with true nutmegs. The aril and seed are used to cure various illnesses, as summarized by Sinclair, l.c.: 173.

Notes — 1. Fieldnotes. Remarkable by its distinct knee-roots, rendering the *Myristica* swamp an appearance similar to mangroves. Stilt roots also present. Bark greenish black, smooth with lenticular spots. Sap red. Fruit with fleshy pericarp. Aril scarlet. Seed brown, shining. Cotelydons (fide Warburg) divaricate, subconnate, with slightly undulate margins, not laciniate.

2. According to Sinclair related to the West Malesian *M. iners, M. malaccensis,* and *M. umbellata,* with which it forms series *Malabaricae* as conceived by him (l.c.: 167), a series which has as outstanding feature the tendency for hairs to be absent on all parts where they normally occur, i.e. the inflorescence, the flowers and the pedicels. *Myristica malabarica* differs from the other species mentioned generally by the smaller leaves, the densely long-haired androphore, and the conspicuously rusty-tomentose fruit. According to Sinclair, series *Malabaricae* is nearest to his series *Maingayae* with generally stouter parts and more conspicuous indumentum.

Within the continental Southeast Asian *Myristicas, M. malabarica* is readily distinguished by its small leaves.

3. According to Manilad & Suresh, J. Econ. & Taxon. Bot. 7 (1) (1985) 205, the living fruit measures 6–10 by 4–6 cm, but the dense tomentum quickly falls off; so also the fruiting part of Rheede's illustration could belong to the type.

Myristica malaccensis Hook. f., Fl. Brit. India 5 (1886) 104.

Distributed in the Malay Peninsula and Borneo but new for Sumatra (*Laumonier 5601, TFB 2037*).

KEY TO THE SUBSPECIES

1a. Leaves comparatively large, blades 15–28 by 7–10 cm, veins strongly reticulate; on lower surface very distinctly, regularly, fine-papillose (lens, × 60!). *Sarawak* ..... subsp. **papillosa** W. J. de Wilde

b. Leaf blades large, or smaller; papillation on lower leaf surface absent or very irregular and faint. *Malay Peninsula, Sumatra, Borneo* .... subsp. **malaccensis**

subsp. **malaccensis**

[Synonym: *M. pandurifolia* Hub. Winkler.]

subsp. **papillosa** W. J. de Wilde, *subspec. nov.*

A subspecie typica in foliis infra distincte minute papillosis differt. — Typus: *Ilias Paie S 36528* (L), Sarawak.

Differs from the type-subspecies by the distinctly fine-papillose lower leaf surface.

Distribution — Borneo. Sarawak: *S 27950, 36528, 48144.*

Note — The presence of papillation on the leaf surface is regarded as an important taxonomic character in *Myristica.* The specimens mentioned are generally stouter than those of subsp. *malaccensis.* Although male flowers are not abundantly at hand, I have the impression that these are identical in both subspecies. More material, including fruiting collections, are needed for deciding on the definite status of the present subsp. *papillosa.*

Myristica maxima Warb., Mon. Myrist. (1897) 385.

Myristica mindanaensis Warb., Mon. Myrist. (1897) 497.
[Synonym: *M. fatua* Houtt. var. *morotaiensis* J. Sinclair.]

Myristica nivea Merr., Philipp. J. Sc. 1, Suppl. (1906) 191.
Specimen seen for the Moluccas: Talaud Is.: *Anon. Plot 9 0328* (1991/1992) (L, sterile).
Distinct by large, membranous leaves, whitish below.

Myristica papyracea J. Sinclair, Gard. Bull. Sing. 23 (1968) 133.

Myristica perlaevis W. J. de Wilde, *spec. nov.*

Omnibus partibus glabris distincta. Folia membranacea supra nitida in sicco. Inflorescentiae pedunculatae. Fructus glaber c. 8 cm longus 3–3.5 cm in diam. in sicco. — Typus: *Burley, Tukirin & Ismail 4330* (A holo; L; K, n.v.), Ceram.

Tree 20 m. *Twigs* medium, towards apex 3(–4) mm diam., drying blackish brown, ± angular, glabrous, bark of twigs lower down palish, grey-brown, coarsely longitudinally cracking, lenticels not apparent. *Leaves* drying thinly membranous; blades elliptic-oblong, broadest at or slightly above the middle, 16–23 by 6–9 cm, base cuneate or nearly rounded, top rather abruptly acute-acuminate; upper surface drying dark olivaceous, glossy, lower surface bright or light brown or olivaceous, nearly glossy, glabrous, not papillose, without scattered dots; midrib ± slender, flat above; nerves 13–15 pairs, at an angle of (50–)60–70° with the midrib, slender and faint, flat or slightly raised above, not contrasting in colour below, lines of interarching indistinct; tertiary veining fine, faint; petiole 20–25 by 1.5–2 mm, drying dark brown, rather contrasting with the twig; terminal sterile leaf bud slender, acute, c. 10 by 1–1.5 mm, with powdery grey-brown tomentum with hairs c. 0.1 mm. *Inflorescences* of male flowers not seen. *Female inflorescence:* glabrous, peduncle 6(–10) mm long, ending in one flower. *Female flower:* glabrous, pedicel c. 12 mm, scar of bracteole 3 mm below the top; perianth hard-carnose, c. 9 by 7 mm, lobes 3, carnose, 4–4.5 mm long, ovary c. 7 by 4.5 mm, minutely pale brown pubescent, stigma short, 2-lobed. *Infructescence* short-peduncled. *Fruit* ellipsoid-oblong, 8–8.5 by 3–3.5 cm, base and top bluntish or narrowly rounded, dry pericarp 8–10(–15) mm thick, outside drying finely wrinkled, brown, glabrous; fruiting pedicel not seen; seed elongate-ellipsoid, 4.5–5 cm long.

Distribution — Known only from the type collection in Ceram: c. 40 km E of Masohi, Ruwa Catchment area, about 3° 11' S, 129° 15' E. — Collection: *Burley, Tukirin & Ismail 4330*, Dec. 3, 1990, NCI (Chicago) voucher specimen.

Ecology — Natural forest with Myristicaceae, Fagaceae, Myrtaceae and Dipterocarps; on steeply dissected ridge; reddish clay soil on gray shale and quartzite bedrock; 275 m altitude. Fr. Dec.

Notes — 1. Fieldnotes. Tree 20 m by 20 cm; bark grey, deeply grooved and longitudinally fissured; inner bark orange-red with red watery sap; flower waxy, yellow; fruit greenish yellow, orange-reddish aril.

2. This species is easily recognized because it is glabrous in all parts, a fine tomentum on the terminal sterile leaf bud excepted. With strong magnification some minute stellate scattered hairs may be seen at the base of the fruit. The male inflorescences (like the female inflorescences and infructescences) are peduncled, so that in the keys to the species of the Moluccas (De Wilde, Blumea 35, 1990: 234–238) the present *M. perlaevis* keys out on p. 234 & 237 beside *M. fragrans* because both are almost glabrous throughout, but the former is distinct by its stouter habit (twigs 3–4 mm diam.).

Myristica philippensis Lam., Hist. Acad. Roy. Sc. Paris (for the year 1788) (1791) 161.

[Synonyms: *M. bracteata* A.DC. (incl. var. longifolia A.DC.), *M. commersonii* Blume, *M. luzonica* Blanco, *M. macrocarpa* Blume.]

Myristica pilosigemma W. J. de Wilde, *spec. nov.*

Gemmae terminalis tomento conspicuo, pilis c. 1 mm longis, inflorescentiis sessilibus, fructu ellipsoideo c. 3.5 cm longo tomento ferrugineo pilis 0.5–1 mm longis distincta. — Typus: *Gutierrez PNH 118078* (L), Philippines, Samar I.

Tree 12 m. *Twigs* subterete, at first minutely inconspicuously pubescent, early glabrescent, smooth or finely striate, yellow-brown or (dark) brown, medium, towards the apex 1.5–2(–2.5) mm diam., bark of twigs lower down finely fissured or thinly flaky, lenticels small and inconspicuous. *Leaves* chartaceous or thinly coriaceous; *blades* elliptic-oblong or oblong-lanceolate, broadest at or somewhat below the middle, 10–24 by 3–6 cm, base ± cuneate or (narrowly) rounded, top acute or faintly acute-acuminate, the very tip acute or bluntish; upper surface drying olivaceous, the lower surface palish, brown-grey, somewhat papillose, at first with short and dense felty tomentum with pale brown appressed hairs of mixed sizes, 0.1–0.4 mm long, late glabrescent, the larger hairs leaving minute dark point-like hair-scars; scattered brown non-traumatic dots absent; midrib narrow, above slightly raised; nerves 14–17 per side, at an angle of 40–60° with the midrib, bright reddish or purplish brown below, contrasting, lines of interarching indistinct, tertiary veining indistinct; petiole 12–18 by 2–2.5 mm; sterile terminal leaf bud 15–20 by 2–3.5 mm, conspicuously roughly pubescent with bright brown ± appressed hairs c. 1 mm long. *Inflorescences* situated axillary of the leaves, simple, sessile, as in the genus *Knema*, i.e., in male a (sub)sessile worm-like scar-covered brachyblast to 13 mm long, terminally with a subumbel of 1–5 flowers of rather various size according to age; peduncle 1 mm or less; minutely rusty pubescent, glabrescent, bracts small, caducous; flowers densely red-brown pubescent with hairs c. 0.2 mm, bracteole situated at the transition of pedicel and perianth, late caducous. *Male flowers:* pedicel slender, c. 3 mm, bracteole ovoid-oblong, c. 3 mm, apically on the pedicel, late caducous or subpersistent, mature perianth in bud ellipsoid-oblong, 4–4.5 by 2(–2.5) mm, top and base obtuse (rounded), not angular, lobes 1.5–2 mm, c. 0.2 mm thick at sutures, erect at anthesis, androe-

cium narrowly cylindrical, c. 3 by 0.5 mm, androphore slender, c. 1.5 by 0.4 mm, minutely pubescent with pale brown hairs 0.2–0.3 mm in lower 1/4 only, synandrium cylindrical, c. 1.5 by 0.5 mm, anthers c. 7 (c. 14 thecae), contiguous, sterile apex rather conspicuous, shallowly lobulate at apex, (0.2–)0.3 mm. *Female inflorescences* and *female flowers* not seen. *Infructescences* sessile, wart-like, c. 5 mm long; fruit solitary, subsessile. *Fruit* ellipsoid, (3–)3.5 by 2.5–3 cm, dry pericarp 4–5 mm thick, with tomentum of woolly hairs 0.5–1 mm; mature seed ellipsoid, (2.5–)3 cm; fruiting pedicel short, 2–3 mm long.

Distribution — Philippines: Samar I., Mindanao. — Collections: *Ramos & Edaño BS 38971* (K, L); *Gutierrez PNH 118078* (K, L).

Ecology — Along trail; c. 600 m altitude. Fl. Apr; fr. June/July.

Notes — 1. Fieldnotes. Tree 12 m, dbh c. 15 cm. Flowers yellow brown.

2. Resembling several species of similar habit, e.g. *M. cumingii* and *M. agusanensis* (with peduncled inflorescences), but readily distinct by the more conspicuous tomentum, with hairs to c. 1 mm long, of sterile terminal leaf bud and fruit.

3. *Myristica pilosigemma* has the whitish lower leaf surface with minute punctation caused by scars of fallen larger hairs in common with several species outside the Philippines, e.g. *M. impressa* from Sulawesi.

Myristica pubicarpa W. J. de Wilde, Blumea 35 (1990) 251.

Regarding the distinction between the two closely related species *M. succedanea* Blume and *M. pubicarpa*, see the original description of the latter. Closer study has revealed that in *M. pubicarpa* the fruit is somewhat smaller, with a tomentum with hairs somewhat longer, and the pericarp more woody, the seed smaller and more rounded, and with a thick fatty-carnose aril more deeply impressed into the seed, as compared to *M. succedanea*. In the latter species the aril (of dried specimens) is much thinner, and not or hardly impressed into the seed coat.

Myristica robusta W. J. de Wilde, Blumea 35 (1990) 253.

Myristica rubrinervis W. J. de Wilde, *spec. nov.*

Myristicae agusanensi similissima, in costa nervisque conspicue purpurascentibus ad rubrescentibus cum pagina inferiore cinerascenti serotine glabrescenti discrepantibus. — Typus: *Ridsdale SMHI 258* (L), Philippines, Palawan.

Tree. *Twigs* towards the apex terete or somewhat angular, 2–3 mm diam., at first with minute tomentum of grey-brown or orange-brown hairs c. 0.1 mm, early glabrescent, coarsely striate, dark brown to (grey-)blackish brown, bark of the twigs lower down dark brown or dark (blackish-)purplish brown, smooth or coarsely striate, with rather inconspicuous lenticels. *Leaves* chartaceous to (sub)coriaceous, elliptic-oblong to (oblong-)lanceolate, (8–)10–16 by (1.8–)3–4.5(–6) cm, base cuneate, top acute acuminate, the very tip subacute or usually bluntish; upper surface drying dull olivaceous to dark brown, the lower surface with rather dense tomentum with (woolly) stellate hairs, grey to rather pale or rusty brown, 0.1–0.2(–0.3) mm, sub-

persistent or rather glabrescent, leaving a distinctly grey-brown or grey surface, with papillae usually distinct (lens, × 60); midrib above slender, flat or somewhat raised, lateral nerves 11–15(–17) pairs, at an angle of c. 45° or less with the midrib, above flat or sunken, indistinct, beneath distinct, like the midrib conspicuously purplish or reddish brown, contrasting with the greyish leaf surface, lines of interarching fairly distinct or indistinct; tertiary venation coarse, often distinct; petiole 12–30(–40) by 1.5–2.5 mm; leaf bud 8–15 by 2–4 mm, densely grey-brown or yellowish brown pubescent with appressed hairs 0.1–0.2 mm. *Inflorescences* paniculate, densely pubescent, the hairs 0.1–0.3 mm, in male 1.5–2.5 cm long, peduncle up to 10 mm long, flattened, central branch c. 5 mm, with 1 or 2 sessile laterals; bracts ovate, c. 3 mm long, caducous; *male flowers* (*Soejarto c.s. 8079*): densely pubescent, perianth oblong, 3–4(–4.5) mm, lobes 1–1.5 mm, pedicel 2–4 mm, slender, bracteole small, apical, caducous; androecium 3.5 mm, column 2 mm, minutely pubescent for the larger part, synandrium 1.5 mm, anthers 6 (i.e. c. 12 thecae); *female inflorescences* (according to infructescences) glabrescent, (1–)1.5–3 cm long; *female flowers* not seen. *Fruit* 1 or 2 (or 3) per infructescence; ovoid-ellipsoid to ellipsoid(-oblong), 3–7 by 2.5–3.5 cm, top and base rounded or narrowly rounded, with persistent scurfy bright orange-brown or rusty tomentum with hairs 0.1–0.2 mm; dry pericarp 2–6 mm thick; fruit stalk 2–4 mm long. *Seed* ellipsoid, 2–4.5 cm long. See further under the varieties.

Note — This new species is known from a number of fruiting specimens from Palawan and Mindoro in the Philippines, all quite distinct from the related *M. agusanensis* by rather more coriaceous leaves with distinctly contrasting purplish or reddish brown midrib on the lower leaf side. Part of the specimens bear fruit nearly twice as large as the remaining specimens, distinguished here as a variety.

KEY TO THE VARIETIES

1a. Lower leaf surface with rather persistent dense tomentum. Fruit 3–4 cm long, dry pericarp 2–3 mm thick ..... var. **rubrinervis**
b. Lower leaf surface glabrescent. Fruit 5–7 cm long, dry pericarp 5–6 mm thick ..... var. **duplex** W. J. de Wilde

var. **rubrinervis**

Tree 8–15 m. Lower *leaf* surface with subpersistent rather dense tomentum of pale or dark brownish or greyish stellate hairs 0.1–0.3 mm, sometimes partially glabrescent. Petiole 1.5–2.5 cm long. *Fruit* ovoid-ellipsoid or ovoid, 3–4 by 2.5–3 cm, with persistent dense dark rusty scurfy tomentum with hairs 0.1–0.2 mm; seed 2–3 cm long.

Distribution — Philippines: Palawan. — Collections: *Podzorski SMHI 528A, 650*; *Ridsdale SMHI 258, 1712*.

Ecology — Stunted montane rain forest with many epiphytes but little moss; closed broad-leaved rain forest on ultrabasic rock; 450–650 m altitude. Fr. March, May.

Notes — 1. Fieldnotes. Bark blackish, shallowly fissured; inner bark reddish purple with red exudate. Fruit brown.

2. The collection *Madulid c.s. PNH 11776*, from Samar I., is referred to a new species, *M. laevis*, but agrees in vegetative habit with var. *rubrinervis*; the specimen differs by its leaves, at first with a very weak, minute tomentum, largely glabrescent, a rather brownish not reddish midrib, and almost globose fruit, at first with minute scurfy dull brown tomentum (hairs c. 0.1 mm), largely glabrescent, with the dry pericarp nearly 10 mm thick. I thought the specimen could represent a third variety of *M. rubrinervis*, but a matching male specimen, *Gutierrez PNH 118091*, proved the new species *M. laevis* manifest.

var. **duplex** W.J. de Wilde, *var. nov.*

A varietate typica in fructu maiore 5–7 cm longus pericarpio crasso 5–6 cm crasso in sicco differt. — Typus: *Ridsdale SMHI 1528* (L), Philippines, Palawan.

Tree 20–30 m. Lower *leaf* surface at first with rather sparse tomentum with hairs 0.1–0.2 mm, (late) glabrescent. Petiole 2–4 cm long. *Fruit* ovoid-oblong or ellipsoid-oblong, top ± narrowly rounded, 5–7 by 3–3.5 cm, with persistent bright rusty scurfy tomentum with hairs 0.1–0.2 mm; seed 3.5–4.5 cm long.

Distribution — Philippines: Palawan, Mindoro, Leyte. — Collections: Palawan: *Ridsdale SMHI 1528*. Mindoro: *Ridsdale 916, 1251*; *Coode 5486* (with Ridsdale & Raynoso). Leyte: *Soejarto c.s. 8079* (slightly deviating, in leaves approaching *M. agusanensis*).

Ecology — Rain forest (with Dipterocarps), and montane and ridge forest (with *Agathis*); 40–900 m altitude. Fl. (immature) & fr. Febr.–Apr.

Notes — 1. Fieldnotes. Large canopy trees to 30 m. Bark of trunk dark brown or blackish brown, pustular or flaky or vertically finely cracked; inner bark red or pinkish brown, with reddish watery sap; wood pale. Leaves pallid or glaucous beneath with yellow nerves. Fruit brown, aril red; seed brown.

2. The species is named after the typically purplish red contrasting colouring of the midrib on the dried lower leaf surface; in fresh leaves *Coode c.s. 5486* noted that the nerves are yellow on the otherwise glaucous lower leaf surface.

Myristica rumphii (Blume) Kosterm.

Myristica rumphii (Blume) Kosterm., Gard. Bull. Sing. 22 (1968) 446. — *Tetranthera rumphii* Blume, Mus. Bot. Lugd. Bat. 1 (1851) 382. — *Litsea rumphii* (Blume) Fern.-Vill. in Blanco, Fl. Filip. Nov. App., ed. 3 (1880) 180. — Type: *Spanoghe s.n.* (L).

Myristica spanogheana Miq., Ann. Mus. Bot. Lugd.-Bat. 2, 1 (1865) 47; Warb., Mon. Myrist. (1897) 531, t. 15 f. 1–4. — *Myristica fatua* Houtt. var. *spanogheana* (Miq.) J. Sinclair, Gard. Bull. Sing. 23 (1968) 304. — Type: *Spanoghe s.n.* (U; iso BO, CAL, K, L, S), W Timor.

Note — *Myristica rumphii* is based on *Tetranthera rumphii* Blume, the type of which (sterile, annotated as from 'Moluccas') was recognized by Kostermans as not belonging to the Lauraceae but to *Myristica*. He supposed that it most likely was conspecific with *M. hollrungii* Warb., but I observed that the type is identical with that of *M. spanogheana*; in fact, it resembles this to such an extent that I suspect that both types are duplicate collections of one and the same gathering, *Spanoghe s.n.*, originating from Timor.

KEY TO THE VARIETIES

1a. Twigs towards apex 2.5–3.5 mm diam., yellowish to reddish brown. Leaves (thinly) chartaceous, the base cuneate to (narrowly) rounded. Fruit 2.5–3.5(–4) cm long, with hairs 0.5–1 mm long. *Lesser Sunda Islands* ..... var. **rumphii**

b. Twigs stoutish, towards the apex 3–4 mm diam., drying blackish brown. Leaves coriaceous, the base broadly rounded or subcordate, sometimes short-cuneate. Fruit c. 4 cm long, with (very) dark brown tomentum of hairs c. 0.3 mm. *Flores* ..... var. **florentis** W.J. de Wilde

var. **rumphii**

[Basionym: *Tetranthera rumphii* Blume.]

[Synonyms: *Litsea rumphii* (Blume) Fern.-Vill., *Myristica spanogheana* Miq., *M. fatua* Houtt. var. *spanogheana* (Miq.) J. Sinclair.]

var. **florentis** W.J. de Wilde, *var. nov.*

A varietate typica in ramulis crassis nigrescentibus, foliis coreaceis, inflorescentiis sessilibus, fructibus c. 4 cm longis tomento dense atro-brunneo pilis 0.2–0.3 mm tantum longis differt. — Typus: *Kostermans & Wirawan 728* (L; iso A, G, K), Flores.

Twigs stoutish, towards the apex 3–4 mm diam., drying blackish brown. *Leaves* coriaceous, elliptic-oblong, broadly rounded or subcordate at base, rarely narrowly rounded, nerves 15–22 pairs; lower leaf surface pale greyish brown, at first with thin tomentum of rather dense to rather spaced brownish scale-like hairs c. 0.1 mm, sometimes scattered with a few longer appressed hairs, late glabrescent. Terminal leaf bud with dense tomentum of hairs c. 0.2 mm. *Fruit* c. 4 cm long, pericarp 4–4.5 mm thick, with dense dark brown tomentum of hairs 0.2–0.3 mm.

Distribution — Lesser Sunda Islands: Flores. — Collections: *Kostermans 22107*; *Kostermans & Wirawan 619, 728*; *Schmutz 632, 1067, 4170, 4171, 4174*; *de Voogd 1802*.

Ecology — Montane forest, 600–1400 m. altitude. Fr. Apr., May, Nov.

Fieldnotes — Bark roughish, 2 mm, dark brown, peeling off in small particles. Living bark light brown. Sap red. Fruit rusty.

Myristica sangowoensis (J. Sinclair) W.J. de Wilde, Blumea 35 (1990) 254.

[Basionym: *M. fatua* Houtt. var. *sangowoensis* J. Sinclair.]

Myristica scripta W.J. de Wilde, Blumea 40 (1995) 323.

var. **scripta**; W.J. de Wilde, Blumea 40 (1995) 324.

Specimens seen for the Moluccas: Aru Is. (Pulau Triangan): *bb 25461*; *Buwalda 5428* (L); *van Balgooy 6317A*.

Distinct from all other Moluccan species by the conspicuous marking of blackish dots and stripes on the lower leaf surface.

Myristica simiarum A.DC., Ann. Sc. Nat. Bot. 4, 4 (1855) 29.

KEY TO THE SUBSPECIES

1a. Fruit globose or broadly ellipsoid, (1.5–)2–2.5(–3) cm long, pseudo-stalk ± absent or short, 2–4 mm broad; dry pericarp 2–4 mm thick. Leaves glabrescent beneath. *Philippines* ..... subsp. **simiarum**

b. Fruit (broadly) ellipsoid or ovoid, 3–3.5 cm long, pseudo-stalk stout, 4–5 mm broad; dry pericarp 4–5 mm thick. Leaves glabrescent beneath or with dispersed hairs. *Sulawesi, Batjan, Sula I., Philippines (Zamboanga)* .... subsp. **celebica** (Miq.) W.J. de Wilde

c. Fruit ellipsoid, 3.5–4 cm long, pseudo-stalk 3–4 mm broad; dry pericarp c. 3 mm thick (apparently much thicker when fresh). Leaves beneath with persistent dense bright brown tomentum. *W & NE Kalimantan, W Sarawak* .... subsp. **calcarea** W.J. de Wilde

subsp. **simiarum**

[Synonyms: *M. discolor* Merr., *M. elliptica* Wall. ex Hook. f. & Thomson var. *simiarum* (A.DC.) J. Sinclair.]

According to Sinclair (1968: 190–194) this species is known from S Taiwan (Botel Tobago Is.) under the name *M. elliptica* var. *simiarum*. I have seen only specimens from the Philippines.

A deviating specimen, *Ridsdale, Dejan & Baquiran ISU 308* from Palanan, NE Luzon, differs by large leaves, up to 32 by 12 cm, and immature fruit, with rather conspicuous yellow rusty silky hairs. When more, similar material becomes available, with flowers and mature fruit, this specimen may appear to belong to a new, separate subspecific taxon.

subsp. **calcarea** W.J. de Wilde, *subspec. nov.*

Arbor 20–26 m alta. Perianthium masculum 7–8 mm longum laete furfuraceo-brunneum pubescens. Flores in pseudo-umbellis in extremitatibus brachyblastorum (*Knema* comparandum) inflorescentiae paniculatae 2–3 cm longae formantibus. A subspecies typica in foliis infra dense pubescentibus, fructu maiore c. 3.5 cm longo differt. — Typus: *Kostermans 13866* (L; iso A, K; SING n.v.), E Kalimantan, Berouw.

Tree 20–36 m. *Leaves* drying olivaceous-brown above, grey-brown or brown beneath because of persistent dense tomentum of flat-lying brown hairs; papillae indistinct or absent. *Male flowers* bright rusty brown pubescent, the perianth 7–8 mm long. *Female flowers* not seen. *Fruit* broad-ellipsoid, 3.5(–4) by 2.5–3 cm, at the base contracted into a pseudo-stalk 2–4 mm long, 3–4 mm broad, top of fruit blunt-acute; (dry) pericarp dull brown, c. 3 mm thick (possibly very much thicker when fresh).

Distribution — Borneo: W & NE Kalimantan, W Sarawak. — Collections: Borneo. NE Kalimantan, E Kutei, Berouw and Sankulirang and vicinity: *Kostermans 5623, 5895, 13365, 13772, 13866*; *(Kostermans) bb 34737*. W Kalimantan: *Burley 3008*. W Sarawak, 1st Div.: *S 34237, 34468*.

Ecology — Forest on (old coral-)limestone or lime and sandstone, hilly country and low mountains, shallow rocky clay soil derived from granite (once), sandstone; 25–700 m altitude. Fl. Sept., fr. collected in June, July, Aug., Sept.

Notes — 1. Fieldnotes. Medium to large tree, to 26 m tall, bole to 15 m long, up to 80 cm diam. Buttresses low, to 1 m high. Dead bark superficially fissured or very rough and deeply fissured, hard, dark brown or red-brown, or black, pitted, c. 5 mm thick, peeling off in irregular strips 2–3 cm wide, 2–3 mm thick. Living bark 10–15 mm thick, undulate, yellowish brown or red-brown or dark red; sap watery, pale red; cambium brown-yellow; sapwood c. 8 cm thick, dirty white or yellowish white, the heartwood dark brown. The lower leaf surface brown or aureous. Flowers yellow or brown yellow. Fruit yellow or orange-red; aril bright red, seed coat brown with yellow streaks.

2. Almost all collections are from limestone or lime-containing soils; once from sandy clay derived from granite (*S 34468*). Distinguished by large, brown-yellow flowers and large fruits, and leaves with persistent, dense, aureous tomentum on the lower surface.

3. Part of the Borneo-specimens on which the present subspecies is based, were included by Sinclair in his *M. elliptica* var. *celebica*, now *M. simiarum* subsp. *celebica*.

4. The fruits may resemble those of the small-fruited *M. elliptica*.

subsp. **celebica** (Miq.) W. J. de Wilde, *comb. nov.*

Myristica celebica Miq., Ann. Mus. Bot. Lugd.-Bat. 2, 1 (1865) 47; Warb., Mon. Myrist. (1897) 395, t. 15 f. 1–6; Koord., Fl. Noord-Oost Celebes (1898) 570 [not *M. celebica* Gandoger, 1919 = *M. fatua* Houtt.]. — *Myristica elliptica* Hook. f. & Thomson var. *celebica* (Miq.) J. Sinclair, Gard. Bull. Sing. 16 (1958) 356; ibid. 23 (1968) 194, f. 12F. — Types: Sulawesi, *Forsten s.n.* (L); *Teijsmann 5801* (BO, U); *de Vriese s.n.*, Batjan (*M. fallax* Miq., in sched.) (L; MEL, n.v.); *de Vriese s.n.*, Buru (no specimens seen).

Myristica fragrans Houtt. f. *sylvestris* Miq., Ann. Mus. Bot. Lugd.-Bat. 1, 2 (1864) 205; ibid. 2, 1 (1865) 48 (sub *M. celebica* Miq.). — Type: *Teijsmann 5872* (BO, SING, U, n.v.).

Note — This taxon occurs in the Philippines, Sulawesi and Moluccas. The Philippine record is based on *Ridsdale 1381*, from Luzon, Zambales.

Myristica smythiesii J. Sinclair, Gard. Bull. Sing. 23 (1968) 316.

Myristica subalulata Miq. var. **subalulata**; Ann. Mus. Lugd.-Bat. 2, 1 (1865) 47.

Myristica succedanea Reinw. ex Blume, Rumphia 1 (1837) 186.

[Synonyms: *M. lakilaki* Murata & Nitta, *M. radja* Miq., *M. schefferi* Warb., *M. speciosa* Warb.]

Myristica sumbawana Warb., Mon. Myrist. (1897) 383, 529 (*sumbavana*).

Myristica teijsmannii Miq., Fl. Ind. Bat. 1, 1 (1858) 57 (*teysmanni*).

[Synonym: *M. hyposticta* Miq.]

Myristica tristis Warb., Mon. Myrist. (1897) 444, t. 19.

KEY TO THE SUBSPECIES

1a. Fruit globose, c. 3 cm diam., the pericarp (when dry) 5–8 mm thick. *N Moluccas* ..... subsp. **moluccana** W. J. de Wilde
b. Fruit globose, less than 2.5 cm diam., or (broadly) ellipsoid; the pericarp 5 mm thick or less 2
2a. Fruit ellipsoid, c. 3.5 cm long; fruiting pedicel c. 2 by 2 mm. *N Moluccas: Bacan I.* ..... subsp. **sessilifructa** W. J. de Wilde
b. Fruit subglobose or broadly ellipsoid, 1.8–2.3(–2.5) cm long; pedicel 3–5 mm 3
3a. Fruit c. 2 cm long, pericarp (2–)3 mm thick; lateral nerves on lower leaf surface not much raised but usually distinct; midrib flat or raised above. *West and East New Guinea* main island (incl. *Vogelkop Peninsula* and islands in the *Geelvink Baai*) ..... subsp. **tristis**
b. Fruit slightly larger (longer), 2.3(–2.5) cm long; lateral nerves on lower leaf surface faint 4
4a. Leaves drying rather glossy at both surfaces; midrib raised above. Fruit brightly rusty pubescent. Bark of the older twigs blackish, strongly finely flaking. *Central southern New Guinea* ..... subsp. **ingambitense** W. J. de Wilde
b. Leaves drying dullish; midrib flattish or but slightly raised above. Fruit chocolate or dull brown. Bark of older twigs grey-brown, striate or slightly cracked, not flaky. *Louisiade Archipelago* ..... subsp. **louisiadensis** W. J. de Wilde

subsp. **moluccana** W. J. de Wilde, *subsp. nov.*

A subspecie typica fructu maiore globoso c. 3 cm diam., pericarpio 5–8 mm crasso in sicco differt. — Typus: *de Vogel 4058* (L), N Moluccas.

Bark of older *twigs* grey-brown, striate or slightly cracked, not flaky. Midrib raised above. Lateral nerves on lower leaf surface weak, but well visible; reticulation faint. *Fruit* globose, c. 3 cm diam., dry pericarp 5–8 mm thick, very thinly greyish pubescent.

Distribution — N Moluccas (Obi Is., Morotai, E Ceram). — Collections: *bb 25843*; *Buwalda 5597, 5641*; *Kostermans 7887, 7889*; *de Vogel 4058, 4161.*

Ecology — Up to 600 m altitude.

subsp. **sessilifructa** W. J. de Wilde, *subsp. nov.*

A subspecie typica fructu subsessili (pedicello fructifero c. 2 mm longo) ellipsoideo c. 3.5 cm longo differt. — Typus: *de Vogel 3858* (L), Moluccas, Bacan I.

Bark of older *twigs* finely striate, not flaking, light brown. *Leaves* membranous, drying dark (blackish) brown, nerves 10–14 per side, thin and faint, reticulation faint; midrib ± raised above. Flowers not seen. *Fruit* solitary, axillary of the (lower) leaves; ellipsoid, c. 3.5 by 1.7 cm, dry pericarp c. 2(–3) mm, pubescence dull brown, with minute hairs 0.1 mm or less.

Distribution — N Moluccas, Bacan I. — Collection: *de Vogel 3858.*

Ecology — Tall forest with little undergrowth on sloping hill ridge; soil loamy with stones, with little humus; 100 m altitude. Fr. Nov.

Notes — 1. Fieldnotes. Solitary tree 12 m, few small buttresses, 50 cm out, clear bole 6 m, dbh 18 cm. Outer bark 0.3 mm thick, dark grey, rather fissured, not peeling off; inner bark 4 mm thick, on section reddish, with little watery hyaline red-brown exudate; sapwood pale yellowish, tinged reddish, gradually passing into the slightly darker heartwood.

2. The true status of this new subspecies is unclear yet; if it concerns a new species, it will be taxonomically close to *M. tristis* s.l. More collections are needed to decide on this, especially while flowers are still lacking. Certainly *M. lepidota* Blume also belongs to the closely related species.

Myristica ultrabasica W.J. de Wilde, *spec. nov.*

Myristica tristis, M. bifurcata et *M. lancifolia* affinis, in foliis parvis coriaceis 2.5–7.5 cm longis, infra papillis carentibus, fructu ellipsoideo 2–2.5 cm longo, pericarpio 1–2 mm crasso in sicco tomento furfuraceo pilis minutis ad 0.1 mm longis differt. — Typus: *van Balgooy 4064* (L; iso K), Central Sulawesi.

Tree 20–30 m. *Twigs* terete, towards the apex slender, 1–2 mm diam., dull dark brown, finely striate or almost smooth, at first with greyish brown tomentum with hairs c. 0.1 mm or less, early glabrescent, bark of twigs lower down greyish-blackish, more coarsely striate, lenticels usually present but inconspicuous. *Leaves* thinly coriaceous, elliptic-oblong to oblong(-lanceolate), (2.5–)4–7.5 by (0.8–)1–2 cm, base attenuate, top subacute to blunt, sometimes narrowly rounded; upper surface drying dull or glossy dark olivaceous-brown to blackish brown, lower surface somewhat paler, greyish brown or reddish brown, glabrous; midrib above flattish, or sunken, or slightly raised; lateral nerves 10–15 pairs, rather closely set, thin, usually invisible above, indistinct or hardly visible beneath, at an angle of c. 45° with the midrib; tertiary venation and marginal arches invisible; lower surface not papillose; petiole slender, 4–9 by 1 mm, drying dark brown, glabrous; terminal leaf bud slender, acute, 3–6 by 1 mm, densely pubescent with very short greyish brown tomentum with hairs 0.1 mm or less. *Inflorescences* situated in-between and below the leaves, essentially of the *Knema*-type, i.e. short sessile wart-like short-shoots, very short-pubescent; male inflorescences not seen; female inflorescences (according to infructescences) c. 1 mm long, few-flowered. *Flowers* not known. *Fruit* solitary, ovate-ellipsoid or ellipsoid, 2–2.5 by 1.5–1.9 cm, base narrowly or broadly rounded, top rounded, sometimes minutely c. 1 mm beaked, pericarp 1–2 mm thick, with persistent dense dull or bright rusty scurfy tomentum with hairs 0.1 mm or less; seed c. 1.7 cm, ellipsoid; fruit stalk 1.5–3 mm long.

Distribution — Central Sulawesi. — Collections: *bb 25533*; *van Balgooy 3692, 3964, 4064.*

Ecology — Forest on ultrabasic (nickel), shales; 400–750 m. Fr. June–Aug.

Notes — 1. Fieldnotes. Tree 20–30 m. Crown small, restricted to top 5 m. Bark purple-grey with fine longitudinal cracks; red sap. Fruit orange or brown; seed covered by orange-red aril.

2. The *bb 25533* specimen in L of the present species was determined by Sinclair in 1962 as *M. lancifolia* var. *montana* or probably a new variety of *M. lancifolia*; in 1968 as *M. lancifolia* var. *bifurcata*. In my present treatment these taxa are accepted as *M. lancifolia* subsp. *montana* and *M. bifurcata*, respectively.

The new collections by Van Balgooy, all in fruit, showed that the curious small thinly coriaceous leaves with faint nerves are quite typical for the present species. Unfortunately flowers are unknown. *Myristica ultrabasica* differs from *M. lancifolia* because the latter has papillae on the lower leaf surface. *Myristica bifurcata* subsp. *sulaica* may be very closely related, but that species has larger leaves, and larger fruit. *Myristica tristis* has larger, thinner leaves, and much larger subglobose fruit.

Myristica umbellata Elmer, Leafl. Philipp. Bot. 5 (1913) 1816.

Myristica villosa Warb., Mon. Myrist. (1897) 419.

Myristica wenzelii Merr., Philipp. J. Sc., Bot. 10 (1915) 270.
[Synonym: *M. fatua* Houtt. var. *wenzelii* (Merr.) J. Sinclair.]

Myristica wyatt-smithii Airy Shaw, Kew Bull. (1948) 251.

This name was in 1958 placed by Sinclair in the synonymy of *M. malaccensis* and in 1968 in the synonymy of *M. iners*, but I have re-instated the species. It seems to be restricted to the Malay Peninsula. I know, however, of two sterile collections from outside the Malay Peninsula which may belong to *M. wyatt-smithii*, e.g., *Lütjeharms 4560* (L) and *Sinclair c.s. 9293* (L):

Lütjeharms 4560 consists of two sterile specimens from Enggano I., off Sumatra in the Indian Ocean. These were named by Sinclair as *M. iners*, but in my opinion do not belong there. They are strongly reminiscent of *M. wyatt-smithii*, especially by the dull grey-brown drying colour of the leaves, but they differ by having fewer lateral veins, 12–15 per side.

Sinclair c.s. 9293 is a sterile collection made in the Sepilok Forest Reserve, Sandakan, Sabah. A few stilt roots are recorded. It resembles much *M. wyatt-smithii* in aspect, including the dull grey-brown drying colour of the leaves. It is distinct by well-developed lines of interarching of the lateral veins, but cannot go with *M. malaccensis*. The sheet was named by Sinclair as *M. iners*, but I do not agree with this. The specimen also may belong to *M. extensa* W.J. de Wilde, spec. nov.

Myristica yunnanensis Y.H. Li, Flora Yunnanica I (1977) 13; Fl. Reip. Pop. Sin. 30 (2) (1979) 190, tab. 87.

I have not seen any material of this species from Yunnan, China. According to the description it is close to *M. guatteriifolia* A.DC. The collection *Geesink, Phanichapol & Santisuk 5729*, from N Thailand, Chieng Mai Prov., at 600–700 m altitude, possibly is *M. yunnanensis*. This collection is in fruit, but these are detached and in the Leiden collection there is no infructescence. The collection differs from material of

the wide-spread *M. guatteriifolia* by having larger fruit, ellipsoid-oblong, 6–6.5 cm long, with large seed, nearly 4.5 cm long, the pericarp with a dense shaggy tomentum with curly rusty hairs c. 1 mm long; and more lateral nerves per side, 20 or more. In *M. guatteriifolia* the fruit is smaller, 2.5–4.5 cm long, and the leaves have 15–19 (–25) lateral nerves per side. The tomentum of the lower leaf surface of *Geesink c.s. 5729* is identical with that of *M. guatteriifolia.*

INDEX

Numbers are page numbers; new names and combinations are in bold type as well as their main mention; accepted names are in roman type; synonyms in italics.