

TAXONOMIC REVIEW OF MYRISTICA (MYRISTICACEAE) IN THE PACIFIC

W. J. J. O. DE WILDE

Rijksherbarium/Hortus Botanicus, Leiden, The Netherlands

SUMMARY

A new account of the genus *Myristica* Gronov. in the Pacific area, here defined as comprising the Carolines, the Solomon Islands including Bougainville, and the islands further towards the East, up to Fiji and Samoa. There are 16 species and eight infraspecific taxa, most locally endemic. Three species, one subspecies, and two forms are described as new; five new subspecific combinations are proposed. Only one key to the species is given, to be used for male flowering as well as for female flowering or fruiting material. The key is primarily based on vegetative characters. Besides the typical appearance of the fruit, also the exact nature of the inflorescences ranks among the major characters for the distinction of species. Fruits are illustrated to enhance the quick recognition of the species. The newly proposed taxa are: *Myristica guadalcanalensis*, *M. xylocarpa*, *M. acsmithii*, *M. kajewskii* subsp. *robusta* and *M. inutilis* subsp. *platyphylla* forma *mesophylla* and forma *nanophylla*; new combinations are: *M. inutilis* subsp. *platyphylla*, *M. inutilis* subsp. *platyphylla* forma *procera*, *M. globosa* subsp. *chalmersii* and subsp. *muelleri*, and *M. hypargyrea* subsp. *insularis*.

INTRODUCTION

The most important recent work on the genus *Myristica* Gronov. in the Pacific was that by A.C. Smith (1941a, b, 1981) and the taxonomic monograph by Sinclair (1968). It is obvious that these authors held quite different opinions on the taxonomy of the genus in this area. Here I put forward my own views on the Pacific species as conceived within the scope of the revision of the Myristicaceae for the whole of Southeast Asia. As based on the thorough revisions by Sinclair (1968, and earlier) I could restrict myself mainly to the study of the material of *Myristica* as present in BM, K and L. These herbaria contain a large number of recent collections, especially from the Solomon Islands, not evaluated by Smith and Sinclair. Some amendments and additions appeared to be necessary. Three new species, one new subspecies and two new forms are described, and five new combinations are proposed.

The Bismarck Archipelago and the Papuan Islands are considered *not* to belong to the Pacific area. The latter region includes the Solomon Islands, with Bougainville, and all islands further to the East, and the Carolines.

DISTRIBUTION

For the area (Fig. 1) 16 indigenous species (five divided into infraspecific entities) are now recognized, most of them with a rather limited, local, range of occurrence,

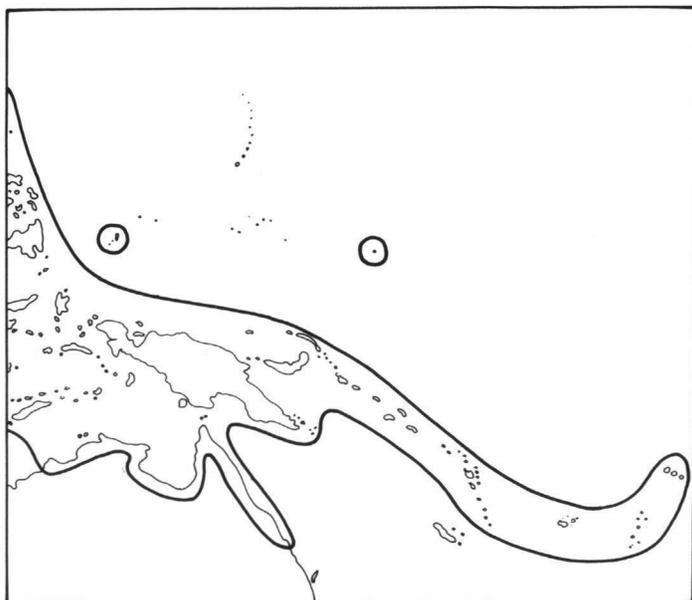


Fig. 1. Distribution of *Myristica* Gronov. in the Pacific. Note the occurrence on Palau and Ponape Islands. Adapted from Sinclair (1968).

but some with a more extended distribution including New Guinea, such as *M. globosa*, *M. schleinitzii*, or in the Pacific *M. hypargyrea*; *M. inutilis* is widespread from New Guinea to far into the Pacific, but in this latter area represented by two allopatric subspecies. An enumeration of the accepted taxa and a survey of their distribution, roughly passing the Pacific area from West to East, is presented in Table 1.

CHARACTERS

Of some of the species, especially of those from the far eastern islands, I have seen only limited herbarium material, and for an understanding of the Fijian species I have partly relied on Smith (1941a, b, 1981). Following most previous authors, the characters of the inflorescences are regarded as foremost in dividing the genus, i.e. for the distinction of the two sections as defined by Sinclair (1968):

- 1) Section *Myristica* (including the cultivated *M. fragrans* Houtt.) with inflorescences generally branched, panicle-like, generally lasting but one flowering season, the common peduncle (hypopodium) distinct, often flattened.
- 2) Section *Fatua*, with *Knema*-like inflorescences, that is, simple or digitately few-branched, woody scar-covered brachyblasts, with the peduncle absent or short, and producing flowers for several seasons.

Table 1. Distribution of taxa of *Myristica* occurring in the Pacific, the cultivated *M. fragrans* omitted.

1. <i>M. inutilis</i>	
a. subsp. <i>inutilis</i>	Samoa (not known from Fiji)
b. subsp. <i>platyphylla</i> (with 4 forms)	Solomon Islands, New Hebrides
2. <i>M. globosa</i>	
a. subsp. <i>chalmersii</i>	New Guinea, Solomon Islands
b. subsp. <i>muelleri</i>	Australia (Queensland), Solomon Islands
3. <i>M. schleinitzii</i>	New Guinea, Solomon Islands
4. <i>M. guadalcanalensis</i>	Solomon Islands
5. <i>M. kajewskii</i>	
a. subsp. <i>kajewskii</i>	} Solomon Islands
b. subsp. <i>robusta</i>	
6. <i>M. cerifera</i>	Solomon Islands
7. <i>M. xylocarpa</i>	Solomon Islands
8. <i>M. petiolata</i>	Solomon Islands
9. <i>M. hypargyraea</i>	
a. subsp. <i>hypargyraea</i>	Samoa, Tonga (not known from Fiji)
b. subsp. <i>insularis</i>	W & E Caroline Islands
10. <i>M. guillauminiana</i>	Santa Cruz, New Hebrides (Banks Is.)
11. <i>M. gillespieana</i>	Fiji Islands
12. <i>M. chartacea</i>	Fiji Islands
13. <i>M. acsmithii</i>	Fiji Islands
14. <i>M. castaneifolia</i>	Fiji Islands
15. <i>M. grandifolia</i>	Fiji Islands
16. <i>M. macrantha</i>	Fiji Islands

These two main types of inflorescences are not at all sharply demarcated (De Wilde, 1992), and possibly the character of the *Knema*-type (or *Myristica fatua*-type) is not monophyletic. Nevertheless, the distinction of two basic types of inflorescences has to remain, to be used as a 'crowbar' character for entering into the taxonomy of the genus wherever it occurs.

All species indigenous to Fiji readily fall into sect. *Fatua*, but other species in the Pacific have more branched inflorescences reminiscent of those of sect. *Myristica*. However, the latter closely link up with good *Fatua*-type inflorescences, and apparently and preferably all Pacific species have to go into one section; see further under the paragraph Illustrations below and Figure 2.

Besides the characters in the inflorescences, a large number of additional characters for species delimitation are in the twigs and leaves, the indumentum, and in the flowers, especially the staminate ones, and, of course, in the fruit.

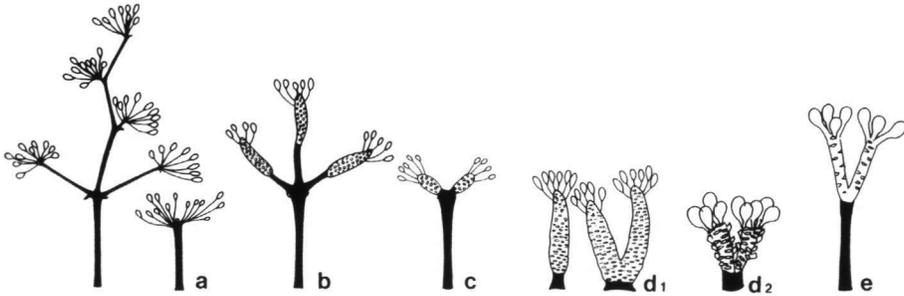


Fig. 2. Types of male inflorescences of *Myristica*, schematic. a. Paniculate type of e.g. *M. iners* Blume, a supposedly primitive type, not found in the Pacific area, from which those in the Pacific can be derived by assuming reductions; b–e. four types of inflorescences, belonging to or associated with the derived *M. fatua* (or *Knema*-)type: b. schematic representation of male inflorescences of *M. schleinitzii*; c. of *M. kajewskii* and *M. petiolata*; d1. of *M. inutilis*, *M. globosa*, *M. guadalcanalensis*, *M. cerifera*, *M. xylocarpa*, *M. guillauminiana*? (male inflorescences not known), *M. chartacea*, *M. acsmithii*, *M. castaneifolia*; d2. of *M. grandifolia* and *M. macrantha*; e. of *M. hypargyrea* and *M. gillespieana*.

KEY

By primarily using vegetative characters, I could construct for the Pacific area a key to the species which serves for identification of all kinds of collections, either male or female flowering, or fruiting specimens. For areas much richer in species, e.g. New Guinea, separate keys for male and female (or fruiting) collections are more practical.

As can be seen in the key to the species, the size of the leaves appeared quite characteristic and useful to recognize most species, but the use of leaf characteristics forced me to admit two species twice in this key.

ILLUSTRATIONS

When describing the species, it appeared that the exact nature and morphology of the inflorescences are not always unequivocally clear and defined, and cannot be easily described; therefore I have schematically depicted the four types of inflorescences, as found in the Pacific species, in Figure 2. For this the male inflorescences have been used, as most characteristic, and generally more amply developed. As a rule, the female inflorescences are essentially similar to the male ones, but they are fewer-flowered and hence more difficult to comprehend. In Figure 2 an 'average' situation is depicted for the inflorescence types, but these are quite characteristic for the species concerned.

As explained in an earlier publication (De Wilde, 1992: fig. 4E–H) the inflorescences in *Myristica* can be classified into several main types, i.e., a supposedly more primitive ('paniculate') type (Fig. 2a) and forms derived from this by reduction. In the Pacific area only derived types occur, and for this area four such types (Fig. 2b, c, d, e) can be distinguished. The flowers are grouped at the end of scar-covered, simple or forked, more or less woody brachyblasts, sessile, or with a more or less distinct but short non scar-covered, smooth, common peduncle, as drawn in Figure 2c.

The inflorescences of these derived types usually are called the *Knema*-type or *Myristica fatua*-type. The situation as in Figure 2d and e links up with Figure 2c; 2b represents the situation in *M. schleinitzii* and *M. petiolata*, where the common peduncle is comparatively long and flattened, and obviously this is closest to the true paniculate type as in Figure 2a; 2e depicts the situation in *M. hypargyrea* where the two lateral flower-bearing arms are, presumably as a secondary evolutionary development, elongated and bear the flowers (or flower scars) wide apart.

Most of the species descriptions are accompanied by a line drawing of the habit, where possible of a fruiting specimen.

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ACKNOWLEDGEMENTS

The possibility to study the material of *Myristica* in the herbarium of the British Museum of Natural History, London (BM) and at Kew (K) is gratefully recognized.

The late Dr. H. O. Sleumer (Oegstgeest) kindly translated the diagnoses of the newly proposed taxa into the Latin language.

Mr. J. H. van Os (L) assisted in the preparation of Figures 1 & 2, and made all the line drawings.

KEY TO THE SPECIES

General key to male flowering, as well as female flowering and fruiting *Myristica* of the Pacific area, primarily based on vegetative characters

- 1a. Mature leaves on lower surface with persistent tomentum, sometimes partially late-glabrescent 2
 b. Lower leaf surface glabrous or early glabrescent 3
 2a. Leaves membranous or chartaceous; tomentum on lower surface minutely felty; petiole not coarsely longitudinally grooved on drying. Fruit 3–5 cm long. Widespread **1. *M. inutilis*** (with 2 subspecies)
 b. Leaves chartaceous or coriaceous; tomentum on lower leaf surface minutely scurfy or powdery, partly glabrescent; petiole coarsely longitudinally grooved with drying. Fruit 5–8 cm long. Central & South Solomon Islands
 **5. *M. kajewskii***
 3a. Leaves of small size class, i.e. leaf blade generally 15(–20) cm long or less. Fruit generally smallish, sometimes large (up to 6 cm long) 4
 b. Leaves larger, blade generally (15–)20 cm long or more. Fruit generally larger (3–8 cm long) 10

- 4a. Inflorescences distinctly peduncled, the peduncle flattened, in male 10 mm long or more. Lower leaf surface papillose (lens!); blade base broadly rounded. (New Guinea and) Solomon Islands **3. *M. schleinitzii***
- b. Inflorescences sessile or but shortly peduncled; peduncle \pm terete. Lower leaf surface papillose or not; blade base usually cuneate 5
- 5a. Lower leaf surface generally greyish with contrasting purplish or brown venation. Fruit 1.5–3 cm long, ellipsoid or (sub)globose; fruiting pedicel 2–5(–7) mm long. Widespread (New Guinea, N Australia, Solomon Islands)
- 2. *M. globosa***
- b. Lower leaf surface drying greyish or brownish, the nerves not conspicuously contrasting. Fruit generally larger, (2.5–)3–6 cm long 6
- 6a. Fruit stalk (fruiting pedicel) 6–10 mm long, 3–5 mm thick. S Solomon Islands **4. *M. guadalcanalensis***
- b. Fruit (sub)sessile, or with short stipe, 5 mm thick or more. Fiji Islands ... 7
- 7a. (Male) inflorescences usually shortly peduncled. Male flowers: bracteole persistent, entire; androphore much shorter than synandrium. Fruit \pm broadly fusiform, stout, 5–6 cm long; stalk (fruiting pedicel) stout, (5–)7–10 mm long, 6–9 mm thick **11. *M. gillespieana***
- b. Inflorescences sessile or subsessile; androphore nearly as long as the synandrium. Fruit smaller, fruiting pedicel shorter 8
- 8a. Twigs generally delicate. Leaves on lower surface not papillose. Bracteole caducous. Fruit (sub)sessile, 4–4.5 cm long **12. *M. chartacea***
- b. Twigs medium or stoutish. Lower leaf surface generally distinctly papillose (lens!). Bracteole (sub)persistent 9
- 9a. Bracteole (in male flowers) \pm 3-dentate. Fruit broadly ellipsoid, 2.5–3.5 cm long; stalk stoutish, 2–5 mm long, 5–7 mm thick **13. *M. ascmithii***
- b. Bracteole entire, top \pm hooded. Fruit ovoid-oblong, base truncate, 3.5–4.5(–5) cm long, (sub)sessile **14. *M. castaneifolia***
- 10a. Inflorescences and infructescences stalked, i.e. with smooth common peduncle, in male inflorescences 10 mm long or more (male inflorescences not seen in *M. petiolata*, but infructescences distinctly peduncled in this species) ... 11
- b. Inflorescences sessile or subsessile; smooth common peduncle in male 5(–8) mm long or less, or absent 12
- 11a. Leaves coriaceous, drying grey-brown below. Male flowers not known. Fruit with pericarp drying woody, tomentum with hairs 1(–2) mm long. Solomon Islands **8. *M. petiolata***
- b. Leaves membranous or chartaceous, drying grey-white below. Male flowers: androecium concave at apex. Pericarp of dry fruit not woody, tomentum with hairs 0.2–0.5 mm long. Samoa–Tonga and Caroline Islands
- 9. *M. hypargyrea*** (with 2 subspecies)
- 12a. Lower leaf surface not papillose (lens!). Solomon Islands 13
- b. Lower leaf surface usually papillose. Islands E of the Solomons: Santa Cruz, New Hebrides, Fiji 15

- 13a. Bark of twigs at apex palish, when older flaky; leaves membranous, petiole 1.5–3 cm long, drying dark brown, ± contrasting with the twig. Mature male perianth 7–9 mm long; androecium deeply hollowed at apex. Fruit 5–7(–8) cm long, with minute tomentum, glabrescent, and pericarp soon becoming scaly-warty by numerous lenticellate cracks **6. *M. cerifera***
- b. Bark of older twigs fissured but not flaky; petioles drying brown, not contrasting. Male perianth smaller; androecium not concave at apex. Fruit pubescent or glabrescent, smooth 14
- 14a. Leaves membranous or thinly chartaceous; petiole 1.5–3(–3.5) cm long, not coarsely longitudinally grooved on drying. Male perianth 4–4.5 mm long, sterile apex of synandrium flattish, with minute scattered hairs. Fruit 5–7 cm long, with tomentum with hairs 1(–1.5) mm long, or glabrescent
7. *M. xylocarpa*
- b. Leaves chartaceous or coriaceous, petiole (2.5–)4–5 cm long, coarsely longitudinally grooved on drying. Male perianth c. 6 mm long, the synandrium at apex ± truncate or shallowly hollowed. Fruit 5–8 cm long, with persistent tomentum with hairs 0.5(–1) mm long **5. *M. kajewskii***
- 15a. Fruit (sub)globose, (when dry) 2.5–3 cm long, pericarp 1–2 mm thick. Santa Cruz Islands, New Hebrides (Banks Is.) **10. *M. guillauminiana***
- b. Fruit ovoid or ovoid-oblong, 3–6 cm long, pericarp thicker. Fiji Islands 16
- 16a. Leaves generally of medium size class, blade 15–30 cm long, with 18–25 nerves per side. Twigs towards apex 3–6 mm diameter. Male inflorescences to 15 mm long; mature perianth 5–6 mm long. Fruit c. 4 cm long
14. *M. castaneifolia*
- b. Leaves large, blade 30–60 cm long, with 20–35 nerves per side. Twigs towards apex c. 10 mm diameter. Male inflorescences coarsely vermiform, coarsely scarred, to 60(–80) mm long; mature male perianth in bud c. 10 mm long 17
- 17a¹ Leaf blades obovate to obovate-lanceolate or oblong-elliptic, gradually narrowed to an acute or obtuse base, or sometimes rounded at base; androecium to 9 mm long at anthesis and then with the androphore 3–4 mm long and pilose in its central portion; fruiting pedicels 5–10 mm long and 8–12 mm in diameter, the mature fruits 5–6(–8) by 3–3.5(–5.5) cm **15. *M. grandifolia***
- b. Leaf blades oblong to oblong-elliptic, base rounded or shallowly cordate; androecium 6–8 mm long at anthesis and then with the androphore not more than 2 mm long and glabrous; fruiting pedicels to 4 mm long and 9 mm in diameter, the mature fruit seldom exceeding 4 by 3 cm **16. *M. macrantha***

1) *Myristica grandifolia* (1856) and *M. macrantha* (1936) are closely related and they may appear to be conspecific when more complete material can be studied, preferably in the field. I have seen only limited herbarium material, and lead 17 of this key is copied largely from the key to the species given by A.C. Smith (1981: 42).



Fig. 3. *Myristica inutilis* Rich. ex A. Gray subsp. *inutilis*. a. Habit of male flowering twig; note shortly peduncled inflorescences of the *Knema*-type, $\times 0.5$; b. male flower, opened lengthwise; note persistent bracteole, perianth valves occupying c. $1/4$ – $1/3$ of the total length of the perianth, androphore largely set with minute pale hairs 0.1 mm or less, $\times 6$; c. leafy twig with infructescence, fruits covered with very short scurfy tomentum, $\times 0.5$ (a, b: Bristol 2030, c: Bristol 1990).

1. *Myristica inutilis* Rich. ex A. Gray — Figs. 3, 4

Myristica inutilis Rich. ex A. Gray in Wilkes, U. S. Explor. Exped. 1 (1854) 34; A. DC., Prod. 14, 1 (1856) 191; Warb., Monogr. Myrist. (1897) 481, t. 18 f. 1–4; A. C. Smith, J. Arnold Arbor. 22 (1941) 74; Bull. Torrey Bot. Club 68 (1941) 400.

For more references and typification, see under the subspecies.

Tree 10–25(–40) m; stem with or without buttresses. *Twigs* small or medium, towards the apex 1.5–4 mm diameter, (sub)terete or sometimes faintly 2-ridged, with minute dense rusty or grey-brown scurf with hairs 0.1–0.2 mm or less, glabrescent, bark dull or bright brown or yellowish brown, smooth or finely striate, bark lower down grey-brown, striate, neither cracking nor flaking, usually densely set with small lenticels. *Leaves*: blades membranous or (thinly) chartaceous, (elliptic-)oblong or oblong-lanceolate, broadest at or slightly above the middle, 12–25(–30) by 3.5–7(–10) cm, base attenuate or (nearly) rounded, top acute-acuminate; upper surface drying olivaceous or (dark) brown, dull, lower surface with persistent tomentum (or rarely late-glabrescent), with densely interwoven, greyish, silvery, or pale cinnamon scale-like hairs, sometimes of rather mixed sizes, 0.1–0.2(–0.4) mm, lower leaf surface not papillose; midrib narrow, flat above, nerves 12–30 per side, flat or slightly sunken above, at an angle of 45–80° with the midrib, line of interarching not prominent, tertiary venation finely or coarsely netted, faint or ± invisible; petiole medium, 10–30 by 1.5–3 mm, brown, glabrescent; sterile terminal bud slender, acute, 10–17 by 1.5–3 mm, densely short pubescent with rusty appressed hairs 0.1–0.2(–0.3) mm. *Inflorescences* situated in-between or just below the leaves; essentially of the *Knema*-type, i.e., a wart-like simple or 2- (or 3-)forked scar-covered brachyblast, up to 12 mm long, sessile or with a smooth common peduncle up to 4 mm long, sometimes situated a few mm supra-axillary, with minute tomentum, glabrescent, bracts small, caducous; in male inflorescences terminally with a cluster of 5–10 flowers, the buds of various size according to age; female inflorescences with similar clusters of 3–10 flowers; flowers short-pubescent with rusty or yellowish or grey-brown hairs 0.1–0.3 mm; bracteole in male persistent (or late-caducous), in female usually (late-)caducous, ovate or ± triangular, (0.5–)1–3 mm long, situated at the top of the pedicel; perianth (in bud) narrowly obtuse at apex, not angular in transverse section. *Male flowers*: pedicel rather slender, 4–6 mm long, mature perianth in bud usually narrow, ellipsoid-oblong, 4–5(–6) by 2–2.5(–3) mm, lobes at suture 0.2–0.3 mm thick, (1–)1.5(–1.8) mm long, i.e. in anthesis ± out-curved and splitting the perianth for c. 1/4–1/3; androecium slender, cylindrical, 4–5 mm long, synandrium cylindrical, 2–2.5(–3) by 0.5–0.7 mm, anthers 5 or 6 (i.e. thecae 10–12, contiguous), sterile apex bluntish, 0.2–0.3 mm, androphore cylindrical, slender, 1.5–2 by 0.3–0.5 mm, largely or only in the lower half very minutely pale brown or greyish pubescent with hairs 0.1 mm or less. *Female flowers*: pedicel 3–5 mm long; perianth (in bud) ovoid, 4–4.5 by 2.5–3.5 mm, lobes c. 1.5 mm long (out-curved in anthesis); ovary ovoid, c. 3 by 2 mm, densely light brown pubescent with hairs 0.1–0.2 mm, stigma 2-lobed, c. 0.3 mm, the lobes sometimes shallowly lobulate. *Infructescences* sessile or subsessile (with common peduncle up to 2 mm), the fruits in clusters of 1–5; fruit subspherical or (broadly) ellipsoid or obovoid-ellipsoid, or oblong, often narrowed towards the base, (2.5–)3–4.5(–7) by 1.8–2.5(–3.3)

cm, rusty or pale brown or grey-brown pubescent with rather mealy tomentum with hairs 0.1–0.6 mm; dry pericarp 2–5(–10) mm thick; fruiting pedicel 3–7(–10) by 3–4(–5?) mm, the scar of the bracteole situated towards the top; seed ellipsoid or oblong, 2–2.5(–3) cm long.

Note — While revising the complex species *Myristica fatua* Hoult. as accepted by Sinclair in his monograph, Gard. Bull. Sing. 23 (1968) 69–72, 268–311, comprising 14 varieties, I came to the conclusion that some of these varieties can better be regarded as species on their own, while other varieties deserve a different status. For New Guinea and the Pacific area I have concluded that most of the material treated by Sinclair under his *Myristica fatua* var. *papuana*, var. *platyphylla*, and var. *inutilis* can better be united into one species, *Myristica inutilis*, separate from *M. fatua* in the restricted sense, the latter being a species confined to the Moluccas. Already A.C. Smith (1941) united the Samoan plants, including the type of *M. inutilis*, with those from the Solomon Islands and the New Hebrides. However, I agree with Sinclair that still a further subdivision can be made, and for *M. inutilis* [a wide-ranging species occurring in New Guinea, the Bismarck Archipelago, Solomon Islands, and New Hebrides to the Samoan Islands] I accept four subspecies, two of which are confined to the Pacific region. Strangely enough, *M. inutilis* seems to be absent from Fiji.

KEY TO THE SUBSPECIES AS OCCURRING IN THE PACIFIC AREA

- 1a. Leaves very short felty-pubescent below, pale, greyish white. Fruit (2.5–)3–3.5 cm long, with generally short mealy tomentum with dull rusty or greyish hairs 0.1(–0.2) mm long. Samoan Islands **a. subsp. *inutilis***
- b. Tomentum of leaves below short or very short, usually cinnamon or 'golden', rarely paler, silvery. Fruit small or large, 3–6(–7) cm long, tomentum pale or usually (dark) rusty, rather rough, with hairs (0.1–)0.2–0.6 mm. New Guinea (incl. Bismarck Archipelago), Solomons, New Hebrides. A variable taxon, with four forms **b. subsp. *platyphylla***

a. subsp. *inutilis* — Fig. 3

Myristica inutilis Rich. ex A. Gray; Guillaumin, J. Arnold Arbor. 14 (1933) 59, p.p.; A.C. Smith, J. Arnold Arbor. 22 (1941) 74, p.p.; Bull. Torrey Bot. Club 68 (1941) 400, p.p. — *Myristica fatua* Hoult. var. *inutilis* (Rich. ex A. Gray) Sinclair, Gard. Bull. Sing. 23 (1968) 278, f. 32. — Type: *Pickering s.n.*, Cpt. Wilkes Exped. (A holo, n.v.; iso K; NY, P, US, n.v.).

Tree 4–15 m. Twigs towards apex 1.5–3 mm diameter. *Leaves* membranous or thinly chartaceous, 12–24 by 3.5–7 cm, on lower surface with dense felty minute whitish or grey-brown (not rusty) tomentum, hairs 0.1–0.2 mm; nerves 14–22 per side, at an angle of 50–80° with the midrib; petiole 15–30 mm long. *Male inflorescences* sessile or with common peduncle up to 4 mm long. Male flower pedicel (4–) 5–6 mm, perianth 5(–6) mm long, androecium 4–5 mm long, synandrium 2–2.5(–3) mm long, androphore c. 2 mm long, for the larger part minutely pubescent. *Fruit* ellipsoid or ellipsoid-oblong, (2.5–)3–3.5 by (1.8–)2 cm, base ± narrowed,

top \pm narrowed or rounded, pericarp c. 2 mm thick, tomentum of grey-brown hairs 0.1(-0.2) mm; fruiting pedicel slender, 3-7 mm long, with the scar of the bracteole 1-2 mm below the top.

Distribution – Samoan Islands, Îles de Horn.

Habitat & Ecology – Shore forest, hill forest; 10-350 m altitude. Flowers Apr., Oct., Nov.; fruit Mar., Aug., Oct.

Vernacular names – Atogi (Upolu), atone (Tutuila), manani (Îles de Horn).

Notes – 1. Fieldnotes: Flowers (pale) brown or rufescent, fruit reported as green or light brown. Leaves glossy dark green above, pale brownish or silvery or grey-green below.

2. I agree with Sinclair (1968) that the present taxon (accepted by him as var. *inutilis* under *M. fatua*) is restricted in its distribution to the Samoan Islands, but Guillaumin (1933) and A.C. Smith (1941) maintain that they cannot see significant differences with the specimens from the Solomon Islands and the New Hebrides. However, some of the specimens, especially from the New Hebrides, link up with the bulk of those from the Samoan Islands, whereas some other collections from Samoa have a striking resemblance to the bulk of the material from the Solomon Islands. The discriminating characters for the Samoan subspecies are listed by Sinclair (l.c.: 282).

Specimens seen. SAMOA. Bristol 1990, 2030; Christophersen 2838; Hochreutiner 3436; McKee 19, 2909; Reinecke 103; Spence 470.

b. subsp. *platyphylla* (A.C. Smith) W.J. de Wilde, *comb. et stat. nov.* — Fig. 4

Myristica platyphylla A.C. Smith, J. Arnold Arbor. 22 (1941) 76. — *Myristica fatua* Houtt. var. *platyphylla* (A.C. Smith) Sinclair, Gard. Bull. Sing. 23 (1968) 300. — Type: *Kajewski 2442* (A, n.v.; iso BO, BRI, G, NSW, P, SING n.v.; BM, L).

Tree 10-25(-40) m, often with buttresses. Twigs towards the apex 1.5-4 mm in diameter. Leaves (thinly) chartaceous or subcoriaceous, 12-25(-30) by 3.5-7(-10) cm, tomentum of lower surface densely felty, greyish or usually silvery or golden-brown or cinnamon, composed of hairs 0.1-0.3(-0.4) mm long; nerves 12-30 per side, at an angle of 45-60° with the midrib; petiole 10-24 mm long. Male inflorescences sessile or with a common peduncle up to 3 mm long. Male flower pedicel 4-5 mm long, perianth 4-5 mm long, androecium 4-4.5 mm long, synandrium 2-2.3 mm long, androphore 1.5-2 mm long, minutely pale-brown pubescent with hairs less than 0.1 mm in the lower half. Fruit mostly obovoid-ellipsoid or oblong, often narrowed towards the base, top rounded, subspherical, or (broadly) ellipsoid, pericarp (dry) 2-5(-10) mm thick, tomentum pale brown or (dark) rusty, with hairs (0.1-0.2-0.6) mm long; fruiting pedicel 3-7(-10) mm long, 3-4(-5) mm thick, the scar of the bracteole situated towards the top.

Distribution – Solomon Islands (incl. Bougainville), New Hebrides.

Habitat & Ecology – Mostly in lowland forest on well-drained soils; also in alluvial forest or periodically flooded forest, rarely in swampy forest; 0-300(-800) m altitude. Flowers and fruit throughout the year. Flowers sometimes recorded as having a sweet smell.

Vernacular name – Solomons: kakala'a (Kwara'ae lang.).

Notes – 1. Fieldnotes: Buttresses, often flying out, frequently reported. Bark smooth, or fissured, or scaly, slash usually recorded as soft, reddish brown, sometimes banded; slash wood soft or hard, white or light brown. Flowers yellow or brown, inside creamy, sometimes scented. Leaves golden, bronze, or coppery below.

2. Variation and infraspecific and infrasubspecific subdivision. The widespread and morphological variable species *M. inutilis* has been divided by me into four subspecies, two of which occur in the Pacific area: the type subspecies is confined to the Samoan area, and subsp. *platyphylla* is restricted to the Solomon Islands and the New Hebrides; the two other subspecies are endemic in New Guinea. As noted before, the distinction of the four subspecies is weak and rather arbitrary.

Subspecies *platyphylla* is considerably variable, especially in general appearance or stoutness (habit) of the leafy twigs and the size of the fruits, as seen in the herbarium collections, and, for convenience's sake, I have accepted four rather intergrading forms within this subspecies, thus procuring names for the generally strikingly differently looking specimens.

The variation in habit, especially leaf size, and size and shape of the fruit, appears to me as seral and at random, and leaf and fruit characters (mainly their sizes) do not correlate. The stouter form (forma *platyphylla*) and the more tiny form (forma *nanophylla*) probably are partly edaphic, occurring on more fertile soils and on poor soils of ridge tops, respectively.

Not all variation within subsp. *platyphylla* is covered by the four forms at present accepted, and a few deviating specimens are acknowledged in the notes under forma *mesophylla* and forma *platyphylla*.

KEY TO THE FORMS OF MYRISTICA INUTILIS SUBSP. PLATYPHYLLA

- 1a. Leaves coriaceous or subcoriaceous, 20–25 cm long, comparatively narrow, 4–6 cm wide. Santa Ysabel, San Cristóbal **b4. forma procera**
- b. Leaves membranous or chartaceous 2
- 2a. Twigs of stout habit, towards the apex 4–5(–6) mm diameter; leaf blades large, (20–)23–30(–40) by 7–12(–18) cm, nerves 20–30(–35) per side. Fruit generally large, 5–7 cm long, (dry) pericarp mostly 5(–10) mm thick; tomentum short, mostly composed of (scurfy) hairs 0.1–0.2(–0.5) mm long. Guadalcanal, Bougainville **b1. forma platyphylla**
- b. Twigs medium, towards the apex (1.5–)2–4 mm in diameter; leaf blades medium-sized, (12–)15–25 by 3.5–7(–10?) cm, nerves 12–18(–20) per side. Fruit various, ellipsoid or oblong, or obovoid-oblong, 3–4.5(–6) cm long, dry pericarp 3–5 mm thick; tomentum various but mostly rather rough or shaggy, with hairs 0.2–0.6 mm long. All over Solomon Islands, including Bougainville, Santa Cruz, New Hebrides, and New Guinea incl. Bismarck Archipelago
b2. forma mesophylla
- c. Twigs slender, towards the apex 1–2 mm diameter; leaf blades small, comparatively narrow, 8–16 by (1.5–)2–3(–4) cm, nerves 10–18 per side. Fruit comparatively small, 3–3.5 cm long, pericarp thin, tomentum various, with hairs 0.1–0.5 mm. Most of the Solomon Islands **b3. forma nanophylla**

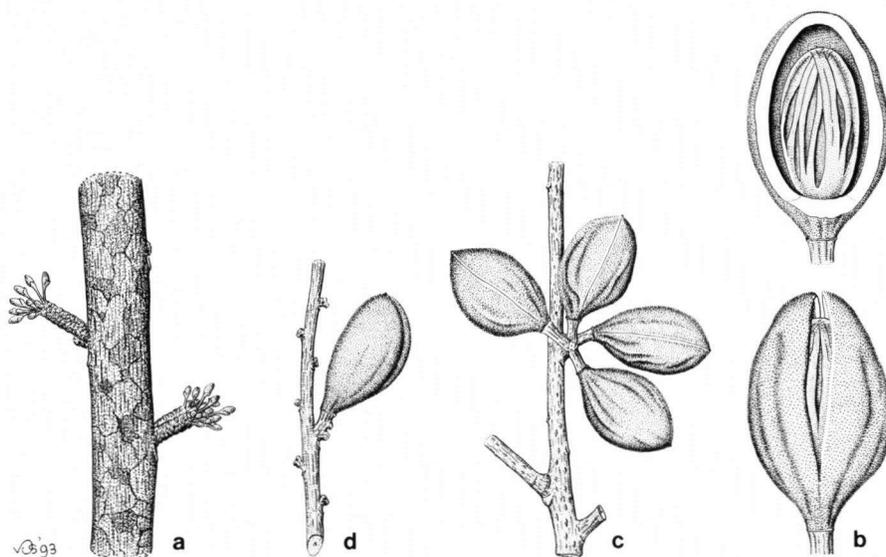


Fig. 4. *Myristica inutilis* Rich. ex A. Gray subsp. *platyphylla* (A.C. Smith) W.J. de Wilde. a, b. Forma *platyphylla*: portion of male flowering twig and detached fruit respectively; c. forma *meso-phylla* W.J. de Wilde: portion of twig with infructescence; d. forma *nanophylla* W.J. de Wilde: portion of twig with infructescence; all $\times 0.5$ (a, b: Womersley & Whitmore BSIP 1129 & Whitmore 6213, c: Chew Wee Lek RSNH 30, d: Whitmore BSIP 892).

b1. forma *platyphylla* — Fig. 4a, b

Distribution – Bougainville, New Georgia (Kolombangara), San Cristóbal, and Guadalcanal (Solomon Islands).

Habitat & Ecology – Riverside forest, seasonal swamp forest; 0–500 m altitude.

Uses – “Young shoots eaten like spinach” (*Waterhouse 210-B*, Bougainville); “Sap is forced into nostrils to stop bleeding” (*Kajewski 2442*, Guadalcanal).

Notes – 1. This taxon is in most respects a stout form as compared to forma *meso-phylla*. Its leaves may reach 40 by 18 cm (e.g. as in *Waterhouse 210-B*). The male inflorescences are ‘vermiform’ and attain 12(–15) mm length in *BSIP 1129* (*Womersley & Whitmore*); *BSIP 640* (*Whitmore*) is another good male flowering collection. The flowers of both cited collections exactly match those of forma *meso-phylla*. Fruits are generally large, 5–7 cm long, with thick pericarp; the seed may reach 2–3 cm in length. The present stout form possibly has developed in relation to its habitat which seems predominantly connected with more fertile soils, along rivers, etc.

2. Deviating and dubious specimens. The following fruiting specimens are broad-leaved (c. 8 cm wide or more) and could belong to forma *platyphylla*, but they deviate especially by smaller fruits with a not very thick pericarp. Possibly they belong to forma *meso-phylla*, as particularly stoutly developed specimens, with broad leaves, but with nerves only 20 per side or less. These specimens are: *BSIP 2533* (New

Georgia), *BSIP 4478* (Malaita), *BSIP 4877* (Ulawa), and *BSIP 6516* (Nanienubuli, Reef Islands), all in L.

Other specimens seen. SOLOMONS. *BSIP 640, 736, 1129, 1132, 1478, 9026, 11777*; *Corner RSS 201*; *Kajewski 1916, 2442* (T); *Morrison 150*; *NGF 599, 16357, 31222*; *Waterhouse 210-B*; *Whitmore 2064, 6213*.

b2. forma mesophylla W.J. de Wilde, *forma nov.* — Fig. 4c

Generaliter differt ramulis apice (1.5–)2–4 mm crassis, laminis (12–)15–25 by 3.5–7 cm, nervis lateralibus 12–18(–20) paribus, fructu 3–4.5(–6) cm longo, pericarpio in sicco 3–5 mm crasso pilisque 0.2–0.6 mm longis tomentosus. — Typus: *Craven & Schodde 100* (L; iso K; A, CANB, LAE, n.v.), Bougainville.

Distribution — As the subspecies.

Notes — 1. This form represents most of the collections made of subsp. *platyphylla*. It comprises the specimens with habit and leaves of the mean size class within the subspecies, as also appears from the key. In this form, which is widely distributed, the shape and size of the fruit is most variable, as indicated in the key. Most fruits have in the dried state a rather pear-shaped form, obovoid-ellipsoid, rather narrowed towards the base; the tomentum is mostly rather woolly or shaggy, with hairs (0.1–)0.2–0.6 mm long.

2. Variation. The specimens from the New Hebrides somewhat deviate from the remainder of the material by comparatively long (female flower and) fruiting pedicels, the latter frequently reaching 8–10 mm.

3. Deviating specimens. Some specimens from the Solomon Islands deviate from the majority of the collections referred to forma *mesophylla*; possibly some of these deserve a taxonomic status on their own, but at present the material is regarded as too limited to warrant a decision. The specimens are the following:

BSIP 3325 and *9388*, both from Guadalcanal I., deviate by their stout habit, the comparatively rough and conspicuous tomentum of the twig apex, and the immature fruit.

BSIP 3658 and *15199*, respectively from Santa Ysabel and Big Nggela, differ by their comparatively strong, rough, dark rusty tomentum of the twig apex with hairs 0.5(–1) mm long, sterile terminal leaf bud, and fruit; the fruit is comparatively broad, ellipsoid.

BSIP 4785, from New Georgia, is a male flowering specimen with unusually small flowers, the perianth measuring only c. 3 mm in length.

BSIP 5354, from Rob Roy Island, SE of Choiseul, bears infructescences shaped as simple or forked ‘worm-like’ brachyblasts, as generally seen in male specimens. The infructescences and the fruit have a conspicuous dark rusty tomentum with hairs 0.5(–1) mm long.

BISP 17606, from Santa Cruz, has a detached fruit (in L) of an unusually broad-ellipsoid shape, c. 4 by 2.5 cm, with the top and base broadly rounded, and with a rather narrow fruiting pedicel; the tomentum is very short, dark rusty, scurfy, with hairs only 0.1–0.2 mm long. In forma *mesophylla* the fruit usually is more pear-shaped, or ellipsoid, often ± narrowed towards the base, and the tomentum composed of hairs (0.1–)0.2–0.6 mm long.

Other specimens seen. SOLOMONS. *BSIP* 683, 923, 1411, 1429, 1662, 1900, 1945, 2415, 2439, 2585, 2697, 2876, 3040, 3075, 3090, 3420, 3522, 3673, 4128, 4159, 4171, 4214, 4749, 4845, 5129, 5490, 5595, 5607, 5741, 5828, 5899, 5923, 5945, 6036, 6091, 6153, 6406, 6561, 6622, 6859, 7033, 7193, 7289, 7393, 7617, 8530, 8753, 8849, 9273, 9555, 10148, 10181, 10218, 10321, 10418, 10479, 10573, 10620, 10740, 10812, 10915, 11009, 11031, 11311, 114041, 1600, 11690, 12452, 12537, 12661, 12752, 12940, 13089, 13141, 13280, 13335, 13404, 13433, 13532, 13713, 13766, 13861, 13966, 14050, 14153, 14204, 14304, 14405, 14465, 14713, 15027, 15139, 15325, 15749, 15822, 15916, 15976, 16017, 16354, 16727, 16734, 16786, 16903, 16953, 16980, 17009, 17141, 17161, 17647, 17765, 17815, 17869, 18009, 18217, 18606; Craven (& Schodde) 100 (T); *Hunt RSS* 2389; *NGF* 16423, 19703, 45639; Schodde (& Craven) 3868, 3979.

NEW HEBRIDES. *Bernardi* 12905, 12964; *RSNH* 30, 260, 329, 1303, 6341, 6342, 16033.

b3. forma nanophylla W.J. de Wilde, *forma nov.* — Fig. 4d

Differt habitu gracili, ramulis apicem versus 1–2 m diam., laminis 8–16 by 1.5–3(–4) cm, nervis lateralibus 12–20 paribus, fructu 3–3.5 cm longo, pericarpio in sicco 2–3 mm crasso, pilis 0.1–0.5 mm longis tomentoso. — Typus: *BSIP* 892 (*Whitmore*) (L), Solomon Islands, New Georgia group, Vanguna Island.

Distribution – Confined to the Solomon Islands.

Notes – 1. Forma *nanophylla* is described to allow for the small and narrow-leaved specimens, with small fruit, beside the three other forms within *M. inutilis* subsp. *platyphylla*, as defined in the key. As pointed out above, these forms are definitely weak ones, as they clearly seem to intergrade mutually. However, I feel forced to recognize these forms in order not to have to accept within one and the same taxon specimens as divergent in habit as those of, for instance, this form *nanophylla*.

2. I suspect that the specimens assigned here to forma *nanophylla* at least partly owe their slender habit to their provenance from mostly poorer soils on the ridges, as most specimens are collected in ridge forest.

3. Flying buttresses have been recorded often; the type specimen was recorded as a c. 40 m tall tree.

4. *Kajewski 2101* (Bougainville) was collected at c. 1000 m altitude.

Specimens seen. SOLOMONS. *BSIP* 892 (T), 2589, 3135, 3829, 6197, 7726, 7759, 9348, 9735, 11272, 16212, 16260, 16506, 17460, 18495; *Hunt RSS* 2913; *Kajewski 2101*.

b4. forma procera (A.C. Smith) W.J. de Wilde, *stat. nov.*

Myristica procera A.C. Smith, *J. Arnold Arbor.* 22 (1941) 79. — Type: *Brass 3434* (A, n.v.; iso L).

Distribution – Solomon Islands: Santa Ysabel, San Cristóbal.

Note – *Myristica procera* was sunk into *M. fatua* var. *papuana* by Sinclair, *Gard. Bull. Sing.* 23 (1968) 294. I prefer to keep it as a form under *M. inutilis* subsp. *platyphylla*. This form is mainly characterized by the subcoriaceous leaves, which are otherwise of the size of forma *platyphylla*. The isotype (L), from low altitude at Santa Ysabel, has (immature) rather small fruit, with a ± thin woody pericarp (as also given in the original description). Most likely also *Brass 3106* (with immature fruit) from San Cristóbal, and *BSIP 2760* (*Whitmore*), from Santa Ysabel, belong here. *Whitmore's* collection is sterile, but annotated as “a very striking tree with golden crown,” in forest with red lateritic clay over ultrabasic rock. I suspect that forma

procera is confined to ultrabasic, although this is not recorded on the labels of the two other collections. Flowers are not known.

Specimens seen. SOLOMONS. *Brass* 3106, 3434 (T); *BSIP* 2760.

2. *Myristica globosa* Warb. — Fig. 5

Myristica globosa Warb., Monogr. Myrist. (1897) 540, t. 19 f. 1, 2; Sinclair, Gard. Bull. Sing. 23 (1968) 378, f. 63, p.p. (excl. *van Royen* 3579).

For further synonyms, see under the subspecies.

Tree 5–30 m. *Twigs* subterete or angular, towards the top usually slender, bright brown or grey-brown, or somewhat reddish or yellowish-brown, smooth or finely striate, 1–2(–2.5) mm diam., with minute grey-brown tomentum, hairs 0.1 mm or less, early glabrescent, twigs lower down terete, the bark finely or coarsely striate, grey-brown or blackish, not or but finely cracking or flaking; small lenticels usually present but not conspicuous. *Leaves*: blades membranous or thinly coriaceous, elliptic-oblong to oblong-lanceolate, broadest at or slightly above or below the middle, 7–16(–21) by 2–7(–8) cm, base attenuate, top acute-acuminate (the very tip sometimes bluntish); upper surface glabrous, drying olivaceous to brown or blackish brown, lower surface glabrous (with sparse tomentum of minute greyish hairs less than 0.1 mm, early glabrescent), generally pale greyish or grey-brown with darker contrasting venation, not or indistinctly papillose; midrib slender, flat (or but slightly raised) or somewhat sunken above; nerves 8–14(–17) pairs, flat or sunken (and sometimes faint) above, at an angle of 45–80° with the midrib, marginal arches not distinct; tertiary venation forming a coarse or rather fine network, reddish brown, generally (not always) conspicuously contrasting with the greyish leaf undersurface; petiole slender, (5–)8–12(–15) by 0.8–2(–2.5) mm, dark brown or reddish brown, glabrous; terminal leaf bud slender, acute, 5–10(–13) by (0.5–)1–2 mm, minutely pubescent with grey-brown or rusty hairs 0.1 mm or less. *Inflorescences* situated in-between and below the leaves: of the *Knema*-type, i.e. sessile, consisting of simple or sometimes 2- or 3-armed scar-covered wart-like short-shoots, up to 4 mm long, rusty pubescent with short hairs, terminally with a cluster or sub-umbel of flowers of differing age and size; male inflorescences with up to 15 flowers (or if 2- or 3-armed with up to 30, e.g. in *LAE* 58538); female inflorescences short, up to 1 mm long, with 1–5 flowers, often of almost equal size and age; flowers rather densely pubescent with appressed (dark) brown hairs 0.1–0.2 mm, sometimes partly glabrescent, bracteole caducous, inserted at or slightly below the top of the pedicel. *Male flowers*: pedicel slender, about as long as or slightly longer than the perianth, 4–6(–7) by 0.4–0.6 mm, bracteole caducous, broadly ovate, 1(–2) mm long, the bracteole-scar situated at the transition to the perianth or up to 1.5 mm lower down; perianth in bud ovoid-oblong or ellipsoid-oblong, variable in size, (4–)5–6.5 by 2–3(–4) mm, top bluntish or subacute, not angular in cross section, base rounded, perianth membranous, its wall (and at sutures) 0.2(–0.3) mm diam., inside usually smooth, perianth lobes 1.5–2.5(–3) mm long, the perianth bud splitting for 1/4 to nearly halfway, ± erect or ± out-curved in anthesis; androecium cylindrical, 3–4(–5.5) by 0.6–0.8(–1) mm, synandrium cylindrical, (2–)2.5–4 by 0.6–0.8 mm, anthers 5–8(–10?), con-

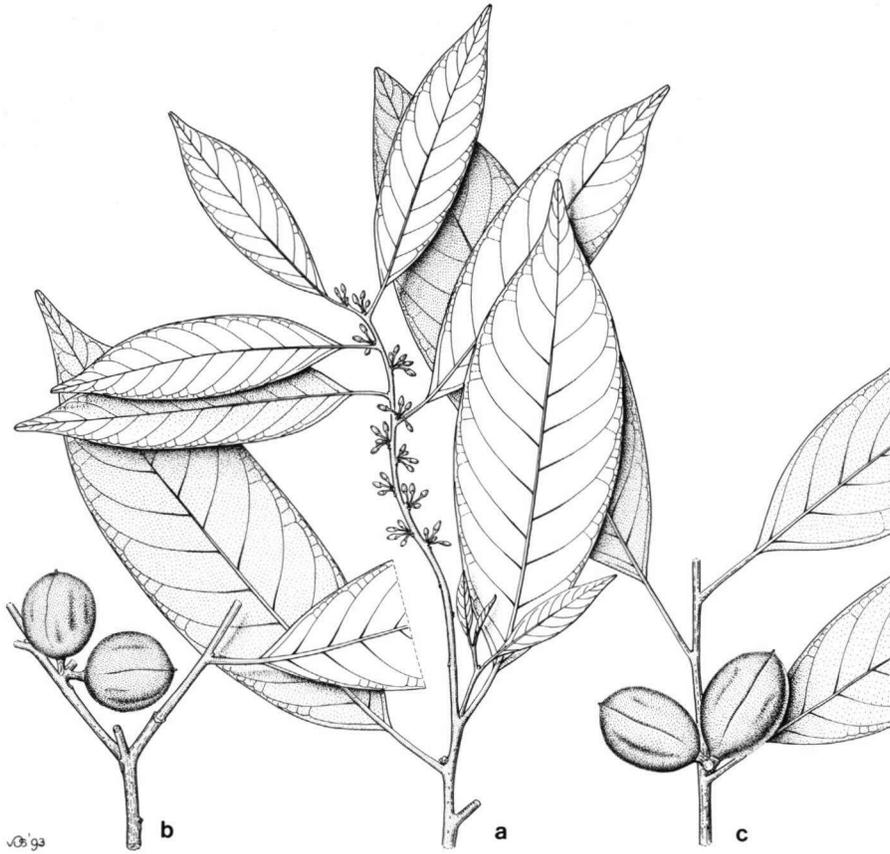


Fig. 5. *Myristica globosa* Warb. subsp. *chalmersii* (Warb.) W.J. de Wilde. a, b. Male flowering twig and fruiting twig respectively, $\times 0.5$. — *M. globosa* subsp. *muelleri* (Warb.) W.J. de Wilde. c. Portion of twig with infructescence; $\times 0.5$ (a: Sayers NGF 19705; b: Fa'arodo & coll. BSIP 11299; c: Runi-kerā & coll. BSIP 11018).

tiguous, sterile apex acutish to flattish, 0.2–0.3 mm long or sometimes less, minutely lobed, androphore cylindrical, shorter than the synandrium, 1.5–2 by 0.4–0.6 mm, more or less pubescent in the lower $2/3$ – $1/3$ with pale brown hairs 0.1–0.3 mm long. *Female flowers*: pedicel straight, comparatively stoutish, 2–2.5 mm long, perianth in bud ovoid, base broadly rounded, c. 4 by 3–3.5 mm, bracteole inserted at or slightly below the transition to the perianth, c. 1 mm long, caducous, perianth lobes 1.5(–2) mm, out-curved in anthesis, ovary ovoid, 2.5–3 by 2–2.5 mm, densely rusty pubescent with hairs c. 0.2 mm, (style and) stigma 2-lobed, c. 0.3 mm. *Fruits* 1–3(–5) per infructescence; (sub)globose to broad ellipsoid, base (narrowly) and top (broadly) rounded, sometimes slightly asymmetrical, variable in size, 1.5–3.2(–4) by 1.5–2.5(–3) cm, densely minutely grey-brown to (bright) rusty pubes-

cent with scurfy hairs (0.1–)0.2–0.5 (–0.8) mm; fruit stalk (fruiting pedicel) slender or thickish, 2–5(–7) mm long; pericarp rather juicy, not woody in vivo, (1–)2–5 mm thick when dry. *Seed* subglobose or (broadly) ellipsoid, 1–2(–2.2) cm long.

Distribution – Three closely resembling subspecies, mostly in lowland, more rarely in submontane everwet or rather seasonal forest in NE Irian Jaya (Jayapura region), the whole of Papua New Guinea (incl. New Britain), the Solomon Islands, and Queensland (subsp. *muelleri*); in the Pacific there are two subspecies. The type subspecies, subsp. *globosa*, differs by generally larger fruit and thicker pericarp, and is confined to New Guinea.

Vernacular name – Aiba'asi (Kwara'ae lang.).

Specimens seen. SOLOMONS. BSIP 2880, 3967, 5596, 6754, 8459, 8698, 8795, 8965, 11599, 12604, 14467, 15670, 18476; Hunt 2588; NGF 19704.

KEY TO THE SUBSPECIES

(based on fruiting material)

- 1a. Fruit 1.5–2.2(–2.4) cm long, globose or subglobose; tomentum with hairs 0.1–0.3 mm long. New Guinea (incl. New Britain), Solomon Islands
 - a. subsp. **chalmersii**
- b. Fruit ellipsoid or broadly ellipsoid, 2–3 cm long; tomentum with hairs (0.1–)0.2–0.5(–0.8) mm long. S Solomon Islands, Australia (Queensland)
 - b. subsp. **muellerii**

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

Myristica chalmersii Warb., Monogr. Myrist. (1897) 519, t. 19. — Type: *Chalmers 5* (B†; iso MEL, n.v.).

Myristica bauerlenii Warb., Monogr. Myrist. (1897) 541, t. 19 f. 1–3; Markgraf, Bot. Jahrb. 67, 2 (1935) 168. — Type: *Bauerlen 1* (B†; iso MEL, n.v.).

Male perianth in anthesis split open by the perianth lobes for 1/3 to nearly halfway. Fruit globose or subglobose, 1.5–2.2(–2.4) cm long; tomentum with hairs 0.1–0.3 mm long; dry pericarp (1–)2–3 mm thick; fruiting pedicel slender, or short and thickish with fissured surface.

Distribution – NE Irian Jaya (Jayapura area), whole of Papua New Guinea (incl. New Britain), whole of the Solomon Islands, recorded from Bougainville, Big Nggela, Choiseul, Guadalcanal, San Cristóbal, Santa Isabel, Kolombangara, (Small) Malaita, New Georgia, Rudora I., Wagina I.

Habitat & Ecology – Locally frequent in forest on well-drained soils, ridge forest, sloping forest, forest on flat plains; also in well-drained mangrove, at 5 m above sea level; up to 550 m altitude. Recorded from volcanic soil, volcanic rocks with red clay-loam soil, basalt ridge with deep clay soil. Flowers and fruit throughout the year.

Fieldnotes – Small to tall tree, 5–22 m; bole usually recorded as straight, rarely as crooked, crown with pendent branches; without or sometimes with (small) buttresses. Bark brown, smooth or (finely) fissured and/or scaly. Slash wood usually recorded as soft, wood white, light brown or reddish brown, slash bark soft; exu-

date reddish, clear, watery, free-flowing or appearing in separate drops, sometimes recorded as sticky. Leaves grey below. Fruit mostly recorded as globular; once reported as with strong spicy odour.

Specimens seen. SOLOMONS. *Brass* 2744; *BSIP* 661,1901, 2542, 4160, 5496, 6386, 7288, 7718, 8310, 8963, 9164, 9991, 10120, 10277, 10299, 10556, 10735, 10829, 10934, 11299, 11633, 12385, 12751, 16063, 16217, 16286, 16359, 16785, 17365, 18610, 18657, 19356; *Kajewski* 2552; *Whitmore* 2063, 6203.

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

Myristica muelleri Warb., *Monogr. Myrist.* (1897) 502, t. 18 f. 1–4; W.J. de Wilde, *Blumea* 36 (1991) 185, f. 1. — Types: *Dallachy s.n.*, in herb. Von Mueller (B†, K; iso FI, MEL, n.v.); *Wilhelmi s.n.* (B†); *Warburg 19500* (B†).

Myristica salomonensis Warb., *Monogr. Myrist.* (1897) 527; K. Schum. & Laut., *Fl. Deut. Schutzgeb. Südsee* (1900) 328; Markgraf, *Bot. Jahrb.* 69 (1938) 397; A.C. Smith, *J. Arnold Arbor.* 22 (1941) 75. — Type: *Comins 127* (K).

Male perianth 4.5–6.5 mm long, in anthesis by the perianth lobes opening for c. 1/4 to slightly over 1/3. Fruit ellipsoid or broadly ellipsoid, 2–3 cm long; tomentum with hairs (0.1–)0.2–0.5(–0.8) mm long; dry pericarp 2–3 mm thick; fruiting pedicel usually slender.

Distribution – Australia (NE Queensland) and southern Solomon Islands: Gonangga (Ranonga) Guadalcanal, Kolombangara, Malaita, New Georgia, San Cristóbal.

The specimens from the Solomons differ slightly from those of Queensland, so that, tentatively and informally, two separate local forms may be distinguished. The Solomon Islands' form: Leaves smaller on average, up to 16 cm long, male perianth opening for c. 1/3 or slightly more, fruit not asymmetrical, with the tomentum with hairs only 0.1–0.3(–0.5) mm long.

Habitat & Ecology – Primary (rarely secondary) rain forest of flat land and ridges, up to c. 550 m altitude; once collected in marshy forest. Flowers and fruit throughout the year. Flowers sometimes recorded as having a smell.

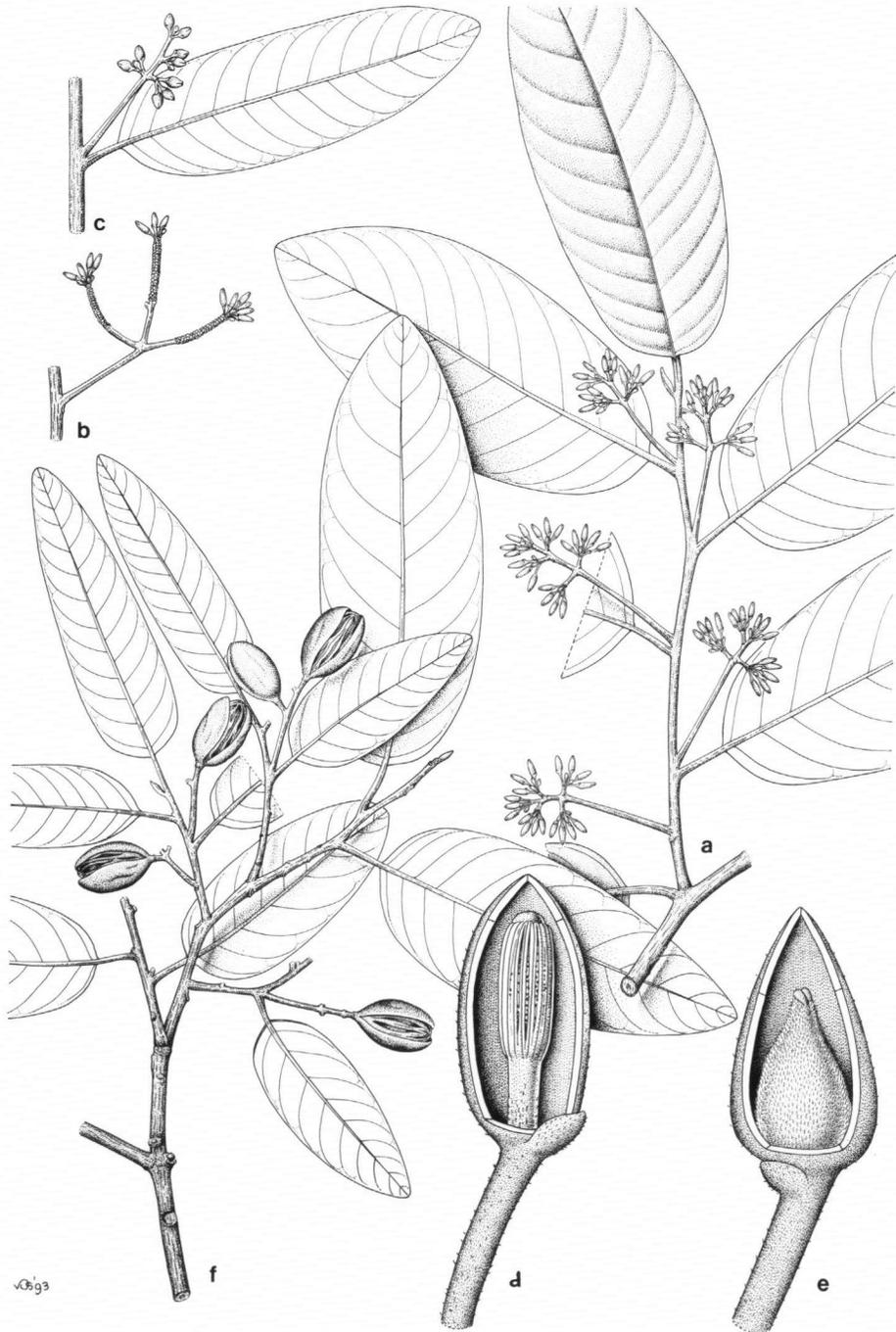
Fieldnotes – Tree to 20 m tall. Bole usually straight, rarely crooked. Small buttresses present or absent, rarely recorded as with small aerial roots. Bark recorded as smooth or most frequently as scaly or dippled, or with lengthwise fissures. Slash bark soft, pale (reddish) brown, slash wood mostly hard, pale brown; exudate red, in separate drops. Fruit brown to orange-yellow, oval or 'lemon-shaped'. Flowers sometimes recorded as being scented.

Specimens seen. SOLOMONS. *BSIP* 769, 3433, 6019, 6402, 7119, 8544, 8814, 9271, 9563, 10719, 11018, 11380, 12152, 12554, 12622, 13574, 14330, 14406, 15761; *Whitmore* 6289B.

3. *Myristica schleinitzii* Engl. — Fig. 6

Myristica schleinitzii Engl., *Bot. Jahrb.* 7, 5 (1886) 455; Forschungsreise S.M.S. 'Gazelle' Bot. Siphonogamen 4 (1889) 29, t. 9; Warb., *Monogr. Myrist.* (1897) 392, t. 19 f. 1, 2; A.C. Smith, *J. Arnold Arbor.* 22 (1941) 74; Sinclair, *Gard. Bull. Sing.* 23 (1968) 202, f. 15. — Type: *Naumann s.n.*, 20 July 1875, New Hanover (B†).

Myristica faroensis Hemsl., *Ann. Bot.* 5 (1891) 506. — Type: *Guppy 209* (K), Santa Isabel.



Tree 5–15(–20) m. *Twigs* towards apex slender, 1.5–3 mm diam., subterete, finely striate, (pale) brown or yellowish, with minute pale tomentum of hairs c. 0.1 mm, glabrescent; bark of twigs lower down yellowish or reddish brown, striate, only when old somewhat fissured or cracking; lenticels present later on, but not apparent. *Leaves* distichous, axillary buds absent or small; blades membranous or thinly chartaceous, elliptic-oblong, broadest at about the middle, 7–27 by 2.5–12 cm, base broadly rounded or shallowly cordate, sometimes subacute, top somewhat narrowed with rounded (blunt) tip; upper surface drying light brown or olivaceous, dull above, lower surface paler, grey-olivaceous, seemingly glabrous but actually set with sparse minute appressed pale brown or yellowish scales 0.1 mm or less (developing twig apex and expanding leaves minutely pale brown pubescent, soon becoming seemingly glabrous); papillae usually distinct (lens, $\times 60!$), dark dots absent; midrib slender, above flat or slightly raised, beneath raised; nerves 8–13(–15) pairs, at $50\text{--}70(-80)^\circ$ with the midrib, curved towards the margin, almost interarching, flat or slightly sunken above, venation (reticulation) coarse, usually indistinct, flat or sunken above, beneath slightly raised or not; petiole slender or medium, 6–20 by 1.5–3 mm, glabrous (glabrescent); leaf bud \pm slender, acute, 5–12(–15) by 1.5–3 mm, densely appressed (bright) brown pubescent with hairs 0.1–0.3 mm. *Inflorescences* situated in-between or below the leaves, glabrescent, paniculate (i.e. with distinct flattened common peduncle), the central branch composed of 1–3 (or 4) stages, sometimes reduced to one flower, or absent; in male: (1–)2–7 cm long, peduncle slender or stoutish, flattened, 10–40 mm long, 1.5–3.5 mm wide, laterals to 20(–25) mm long, central branch absent or with 1–3 (or 4) stages, up to 30 mm long; flowers clustered into sub-umbels of 3–10 flowers (in different stages of development) and not rarely producing scar-covered brachyblasts up to 15 mm long; female inflorescences resembling the males, generally but slightly smaller (shorter) and with fewer flowers, 2–6 in a cluster; bracts minute, 1–1.5 mm, pubescent, caducous, their scars sometimes some distance moved-up on the laterals. *Flowers* thinly appressed-pubescent with (dark) brown hairs c. 0.1 mm, more densely so on pedicel and the persistent bracteole; the perianth membranous (at the sutures c. 0.3 mm diam.), sometimes partly glabrescent, inside glabrous; lobes 3, at anthesis splitting the perianth for $(1/5\text{--})1/4\text{--}1/3$, in bud the apical portion not or but faintly angular, bracteole ovate to oblong, densely short-pubescent, persistent, 1–1.5 mm long, situated usually at the top of the pedicel appressed to the base of the perianth. *Male flowers*: pedicel slender, 3.5–5 mm long, 0.5–0.7 mm thick; mature perianth in bud situated somewhat oblique to the pedicel, ovoid-oblong, broadest below the middle, 5.5–6.5 by 2.5–3.5 mm, base broadly rounded, towards the top somewhat narrowed, top subacute or bluntish; valves 1.5–2 mm long, out-curved in anthesis; androecium

Fig. 6. *Myristica schleinitzii* Engl. a. Habit of twig with male inflorescences, $\times 0.5$; b. aged male inflorescence axillary to leaf scar, having developed distinct scar-covered flower-bearing brachyblasts, $\times 0.5$; c. female inflorescence, $\times 0.5$, d. male flower, the mature perianth in bud longitudinally opened to show androecium, $\times 6$; e. opened mature female flower just before anthesis, $\times 6$; f. habit of branch with infructescences with mature fruit, $\times 0.5$ (a, d: *Goetghebeur 3379*; b: *Brass 3288*; c, e: *Lauterbach 1492*; f: *Croft & Katik NGF 15512*).

slender, 5–6 by 0.7–1 mm, synandrium cylindrical, 2.5–4 by 0.7–1 mm, top blunt, often with short sterile appendages 0.1 mm, corresponding with the anthers, sterile central apex c. 0.2 mm or absent, anthers 6–8 (i.e. 10–15 thecae), closely appressed, gradually passing into the cylindrical androphore, about as wide as the synandrium, 2–2.5 mm long, (sub)glabrous or with sparse tomentum of minute pale hairs 0.1 mm or less. *Female flowers*: pedicel slender, 2–5 mm long; mature perianth ovoid-oblong, membranous, 4.5–5.5 by 2.5–3 mm, top narrowed, acutish, lobes splitting the perianth for c. 1/3, ± reflexed in anthesis; ovary ovoid-ellipsoid, densely short pubescent with pale hairs less than 0.1 mm, c. 3.5 by 2 mm, narrowed upward into the sessile shallowly 2-lipped stigma c. 0.2 mm. *Fruits* solitary or mostly 2–6 per infructescence; ellipsoid to oblong, 2–3.5(–4; see note 3) by 1–1.7 cm, top (sub)acute, base (sub)acute or (when dry) narrowed into an up to 5 mm long pseudostalk, dry pericarp 0.5–1 mm thick, (dark or pale) brown, wrinkled or more or less longitudinally striate, with mealy tomentum of pale brown hairs 0.1–0.2 mm, glabrescent except at very base and top. *Seed* ellipsoid, 2–2.5(–3) cm long, (blackish or) dark brown; aril deeply slenderly lacinate; fruiting pedicel ± slender, 3–7 mm long.

Distribution – Northern part of Papua New Guinea including Bismarck Archipelago, and Solomon Islands: Bougainville, Santa Isabel, Novatana, New Georgia group. One deviating specimen from Guadalcanal; see note 3.

Habitat & Ecology – Cliff-face forest, forest on crests, well-drained forest of coastal areas, sand dunes, coral beach, beach forest behind mangrove, swampy mangrove forest; also inland but not too far from the sea; 0–200(–350) m altitude.

Vernacular names – Aiba'asi, u-we-pikira (Guadalcanal), kukuasi, kuku-asi (Bougainville).

Notes – 1. Fieldnotes. Erect or bushy trees, stem crooked or not; branches sometimes whorled, horizontal (*Terminalia*-branching). Stem mostly recorded as without buttresses, stiltroots occasionally present. Largely glabrous, but growing twigs with developing leaves and inflorescences with dense short brown-yellow tomentum. Leaves glossy (blue-)green above, pale green to glaucous beneath, midrib yellowish. Bark soft, brown-red, when old grey-brown to blackish, longitudinally fissured and/or flaking (scaly); slash bark banded or not, straw turning pink-red or pink-brown, exudate watery or opaque, often pinkish; wood rather hard, pale or straw or orange, discolouring to brown, heartwood reddish. Flowers cream or green yellow or yellow, reported as scented but also as without smell, reported sometimes as 'not opening'. Fruit green-yellow or orange, partly with thin golden tomentum. *Seed* dark brown to black, glossy, aril red, seed slightly aromatic (seed in mature fruit once recorded as white with yellow-green aril: *Whitmore BSIP 2684*, Solomon Is.). Flowers and fruit throughout the year.

2. Related to *M. rosseleensis* Sinclair, *M. inopinata* Sinclair, and *M. garciniifolia* Warb. from New Guinea, the latter two with stouter leaves.

3. A homogeneous well-demarcated species, characterized by its paniculate inflorescences with flattened main peduncle, the elegant yellowish twigs with leaves of small or medium size, often with subcordate base, drying greenish, the papillose undersurface (lens, × 60!), and the smallish subglabrous fruit in peduncled inflorescences. Largely a coastal species.

4. A deviating specimen, *BSIP 12412 (Mauriasi & coll.)*, from SW Guadalcanal, Solomons, vegetatively completely agrees with all other specimens of *M. schleinitzii*, but differs by inflorescences with one single fruit as large as 4 by 2.5 cm (including pseudostalk c. 5 mm long), containing a seed c. 3 cm long.

Specimens seen. SOLOMONS. *Brass 3237, 3288; BSIP 2684, 3011, 4168, 5626, 8862, 10798, 12412, 12599, 12912, 13759, 13781, 14168, 14226, 14427, 14514, 14515, 14538, 14584, 15065, 15125, 15180, 15236, 15356, 15407, 15484, 15569, 15794, 15845, 15992, 16140, 16513, 17339, 18195, 18443, 18692, 18890; Hunt RSS 2792; Kajewski 1582, 2236.*

4. *Myristica guadalcanalensis* W.J. de Wilde, *spec. nov.* — Fig. 7

Myristica guadalcanalensis Sinclair, *Gard. Bull. Sing.* 23 (1968) 3, 357, f. 57, nom. inval. — Based on *BSIP 36*.

A *Myristica insipida* et *M. globosa* differt foliorum facie inferiore haud papilloso, nervis haud discoloribus, fructu magno, c. 5 by 3 cm, tomento pulverulento e pilis 0.1 mm longis vel brevioribus constructo. — Typus: *BSIP 5003 (Kere)* (L), Solomon Islands, Guadalcanal.

Tree 8–30 m. *Twigs* in apical portion slender, \pm terete or drying somewhat angular, 1–2 mm diam., dull (yellowish) brown, smooth or finely striate, greyish shaggy pubescent with hairs 0.1 mm or less, early glabrescent; bark or older twigs striate, sometimes \pm grooved, not longitudinally cracking, nor flaking; lenticels not apparent. *Leaf blades* (thinly) chartaceous, elliptic-oblong to oblong-lanceolate, broadest at or somewhat above the middle, 8–17(–20) by 2.5–5.5(–6.5) cm, base attenuate, top acute or somewhat acute-acuminate; upper surface drying olivaceous, lower surface slightly paler, with minute weak tomentum with greyish hairs less than 0.1 mm, glabrescent; lower surface not papillose, without scattered dark brown dots (smallish dots sometimes locally present, but not all over the leaf surface); midrib slender, flat or slightly raised above; nerves 10–15 pairs, at an angle of 60–70° with the midrib, flat above, not much contrasting of colour beneath, marginal arches indistinct, tertiary venation faint at both surfaces; petiole medium to rather long, yellowish brown, glabrous, 8–23 by 1–2.5 mm; terminal leaf bud slender, acute, 8–15 by 1–1.5 mm, appressed pubescent with golden- or grey-brown hairs 0.1 mm or less. *Inflorescences* situated in-between the leaves, sessile (in female) or subsessile (in male, *BSIP 14648*, see note 4), of the *Knema*-type, i.e. in male: a simple or forked scar-covered short-shoot, up to 3 mm long, short-pubescent, on a short, 1–1.5 mm long, striate, glabrous, common peduncle, the flowers terminally in clusters of 4–10, of varying age and size; female inflorescences completely sessile, small, with 1–3 flowers, flowers thinly grey-brown pubescent with hairs c. 0.1 mm, the bracteole (sub)persistent, inserted at or close to the top of the pedicel. *Male flowers*: pedicel (3–)3.5–4 mm long, 0.5–0.6 mm thick, slightly shorter than the perianth, bracteole (sub)persistent, \pm broad-ovate, 1–1.5 mm long, ciliate, inserted at the transition to the perianth; perianth ellipsoid-oblong, 4.5–5 by 2.5–2.7 mm, base and top (broadly) rounded, the apical portion not angular in transverse section, perianth membranous, 0.2(–0.3) mm thick, inside towards the base with irregularly shaped thickenings; perianth lobes c. 2 mm long, hence splitting the bud for c. 1/3 to nearly halfway, slightly out-curved at anthesis; androecium cylindrical, c. 4.5 by 0.9 mm, andro-



Fig. 7. *Myristica guadalcanalensis* W.J. de Wilde. a. Portion of leafy twig with male inflorescence, $\times 0.5$; b. male flower, perianth lengthwise opened showing androecium; note caducous bracteole, $\times 6$; c. leafy twig with one-fruited infructescence, $\times 0.5$ (a, b: Gafui & coll. BSIP 14648; c: BSIP 14850).

phore c. 1.5 by 0.6–0.7 mm, largely thinly pubescent with pale appressed hairs 0.1 mm or less, synandrium c. 3 by 0.8–0.9 mm, including the faintly lobed, blunt, sterile apex c. 0.2 mm; anthers c. 8, rather spaced. *Female flowers*: pedicel 2.5–3 mm long, the bracteole situated c. 1 mm below the perianth, perianth ovoid-oblong, c. 4 by 2.5–3 mm, lobes c. 1.5 mm, reflexed in anthesis (perianth then urceolate), ovary including stigma c. 2.5 by 1.5 mm. *Fruit* single or 2 or 3 together; ellipsoid, 4.5–5 by 2.5–3 cm, top rounded, mostly contracted into a short pseudostalk 2–3

mm long, pericarp minutely dull pale brown 'mealy' pubescent with hairs c. 0.1 mm or less, sometimes glabrescent; dry pericarp 2–3(–4) mm thick; stalk 6–10 mm long, thickish (3–5 mm diam.), with \pm fissured surface, the scar of the bracteole c. 2 mm below the fruit. *Seed* ellipsoid, (2.5–)3 cm long.

Distribution – Endemic of the southern Solomon Islands (Guadalcanal, Rennell, Malaita I.).

Habitat & Ecology – Well-drained primary and secondary forest of plains and ridges; 30–200 m altitude; flowers May, July; fruit May, July, Dec.

Vernacular name – Aiba'asi (Kwara'ae lang.).

Notes – 1. Fieldnotes. Straight-boled tree, to c. 30 m; buttresses present or absent. Bark dark brown or almost black, scaly, or fissured; slash bark all one colour, brown-red or light brown; slash wood hard or soft, brown or reddish-brown. Flowers yellowish white; fruit brown. Once annotated as: "the fruits are about double the size of Aibaasi."

2. This species was originally recognized and described and to be published by Sinclair as a new species, based on *Walker & White BSIP 36*, in *Gard. Bull. Sing.* 23 (1968) 357, f. 57; a female flowering and fruiting collection. As noted on page 3 (Sinclair, l.c.), in a footnote, the author came to the conclusion, just before the final printing and after having seen additional material, that it would belong to *M. insipida*; hence, the Latin diagnosis was intentionally deleted from the description, rendering the name *guadalcanalensis* invalid.

After studying still more material of the present taxon, I have come to the conclusion that it still merits the rank of a species of its own, close to *M. globosa*, the latter being a very variable species, and widespread in the Solomon Islands.

Apparently Sinclair (l.c.), when withdrawing his intended new species under *M. insipida*, actually meant *M. globosa*, because, also according to Sinclair, *M. insipida* does not occur in the Solomon Islands. Indeed, the leaves are reminiscent of those of *M. insipida*, but in this latter species the lower surface is papillose.

3. *Myristica guadalcanalensis* is closely related to *M. globosa*, the New Guinean *M. tristis* Warb., and allied species. The male flowers, known from but one collection (see note 4), are very similar but in other characters there are marked differences: in *M. globosa* the leaves are generally conspicuously pale and greyish below, with markedly contrasting (red-)brown venation and reticulation, the fruits are smaller, and if large, then almost globose (not ellipsoid), and generally the peduncle is shorter.

4. The only male flowering specimen of *M. guadalcanalensis* seen is *Gafui & coll. BSIP 14648*. The inflorescences have a distinct, though short, common peduncle of c. 1.5 mm long. Because the close relationship with *M. globosa* and allies, I am inclined to consider the inflorescences still as sessile, of the *Knema*-type, and, for convenience's sake, it is treated as such in the key. It must be noted that short-peduncled inflorescences occur not rarely in the genus *Knema* (e.g. *K. elegans*, *K. austrosiamensis*, and others). More male flowering material should elucidate the true nature of the inflorescences; the several female collections seen all have sessile inflorescences.

Specimens seen. SOLOMONS. *BSIP 36, 4987, 5003, 9657, 12301, 14648, 14748, 14802, 14850, 14870, 14939, 14992; Kajewski 2373.*

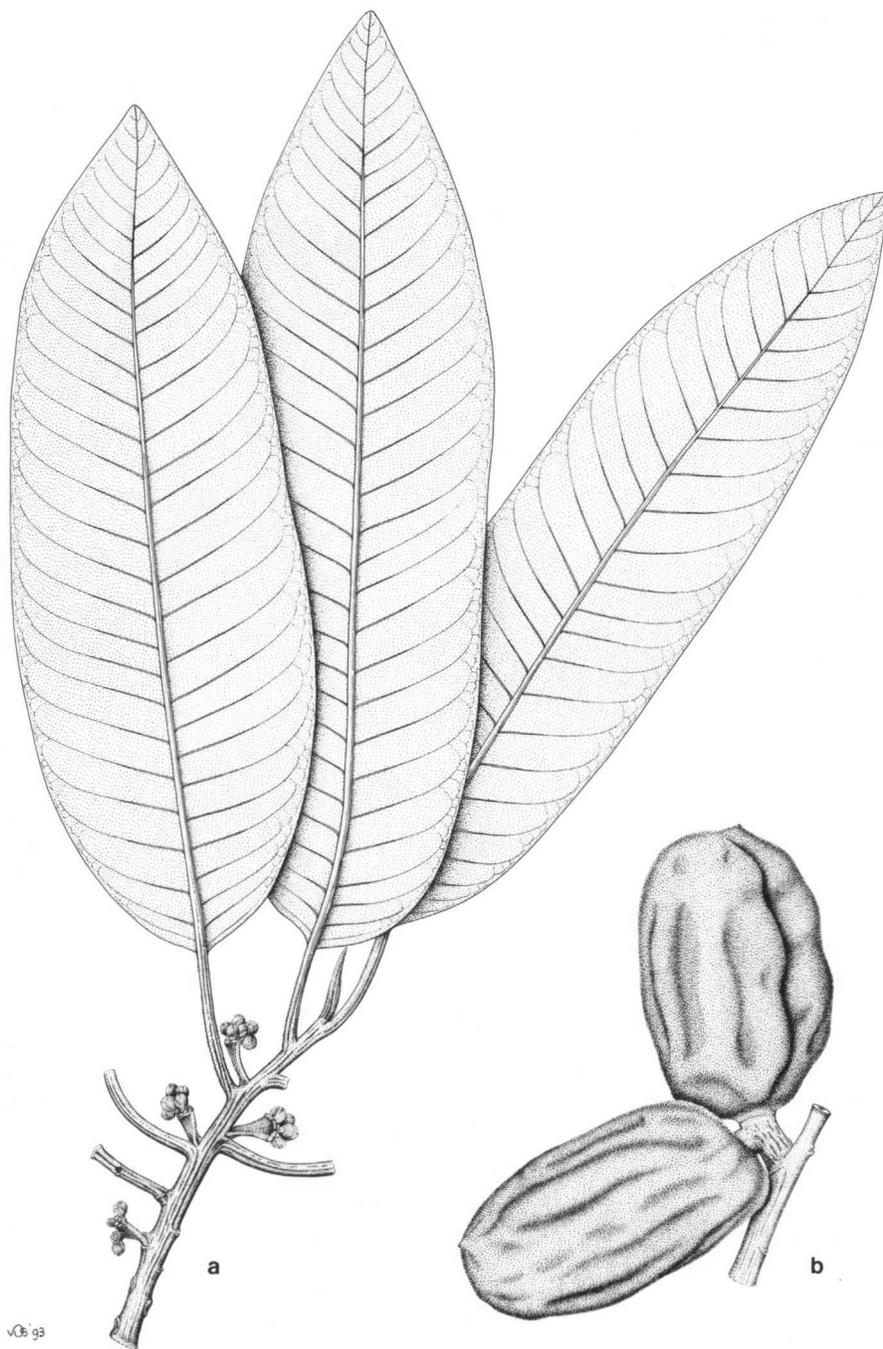


Fig. 8. *Myristica kajewskii* A.C. Smith subsp. *kajewskii*. a. Habit of leafy twig with male inflorescences; b. portion of older twig with infructescence; note presence of short common peduncle; both $\times 0.5$ (a: Whitmore BSIP 4274; b: Runikora & coll. BSIP 9724).

5. *Myristica kajewskii* A.C. Smith — Figs. 8, 9

Myristica kajewskii A.C. Smith, *J. Arnold Arbor.* 22 (1941) 68 (excl. specimens from Bougainville); Sinclair, *Gard. Bull. Sing.* 23 (1968) 412, for the smallest part, excl. *M. cerifera*, excl. fig. 70. — Type: *Kajewski 2613* (A, n.v.; iso BM, BO, BRI, G, L, P, SING).

Myristica petiolata auct. non A.C. Smith: Sinclair, *Gard. Bull. Sing.* 23 (1968) 513, f. 86 (i.e. the description and figure of a male flowering specimen, *Whitmore BSIP 4274*).

Tree 8–26 m. *Twigs* subterete, stoutish, (3–)4–6(–7) mm diam., coarsely striate or grooved, dull brown or bright light brown, with very minute tomentum with greyish hairs less than 0.1 mm, early glabrescent; bark of twigs lower down grey-brown, ± longitudinally cracking, with scattered greyish lenticels. *Leaves* in two rows; blades chartaceous or coriaceous, elliptic-oblong to oblong(-lanceolate), broadest at about the middle or ± parallel-sided, 22–37 by 3–14 cm, top subacute or acute-acuminate, with bluntish or acute tip, base broadly cuneate or usually rounded or shallowly cordate; upper surface drying olivaceous or brown, lower surface grey or grey brown or pale brown, nearly glabrous or with dense rusty mealy (scaly) tomentum with hairs c. 0.1 mm, glabrescent or subpersistent, lower leaf surface not papillose; midrib medium or stoutish, flat or slightly raised above, nerves 20–30 pairs, flat above, at an angle of 50–70° with the midrib, tertiary venation forming a coarse network, bright brown and usually contrasting below; petiole stout, comparatively long, (25–)40–50 by 3–5 mm, coarsely longitudinally grooved or ribbed with drying, grey-brown and glabrous as the twigs; terminal sterile leaf bud medium, 10–15(–20) by 2.5–3 mm, very short grey-brown appressed-pubescent with hairs 0.1 mm or less. *Inflorescences* in-between or just below the leaves, a structure of a mixture of the paniculate and the *Knema*-type, i.e. in male subsessile or with a short, stout, flattened common peduncle 5–10(–12) mm long, with simple or 2- or 3-furcate scar-covered arms up to 5 mm long, terminally with a few-flowered sub-umbel of 3–5 flowers of various age and size, glabrous or short rusty pubescent, glabrescent; female inflorescences not branched, fewer flowered than male; bracts small, 1–1.5 mm, caducous; flowers densely dark brown or rusty pubescent with hairs (0.1–)0.2 mm. *Male flowers*: medium, rather coriaceous pedicel c. 2 by 1.5 mm, somewhat flattened, bracteole caducous, hemi-circular or broadly triangular, usually 3-topped, c. 3 by 5 mm, mature perianth in bud ovoid-ellipsoid, c. 6 by 5 mm, top and base (broadly) rounded, lobes splitting the bud to about halfway, thickish, coriaceous, drying inside rather wrinkled, androecium subcylindrical, (when dry) c. 3.5 by 1.5 mm, the androphore short, cylindrical, c. 0.5 by 0.7 mm, glabrous but with at very base a collar of densely set short rufous hairs c. 0.1 mm, androecium subcylindrical, c. 3 by 1.5 mm, top truncate, sterile apex shallowly hollowed, anthers c. 13 (?), narrow, contiguous; mature female flowers not seen. *Fruit* solitary, 1 or 2 per inflorescence, broadly (ovoid-) ellipsoid or subglobose, 5–8 by (3.5–)4–5 cm, top and base (broadly) rounded, pericarp thick, when dry c. 10 mm thick, with persistent dense dark brown pubescence with hairs 0.5(–1) mm long; peduncle stout, 5–10 mm long. *Seed* ellipsoid-oblong, 4–5 cm long.

Distribution – Central and southern Solomon Islands (Choiseul, Guadalcanal, San Cristóbal), with two subspecies.

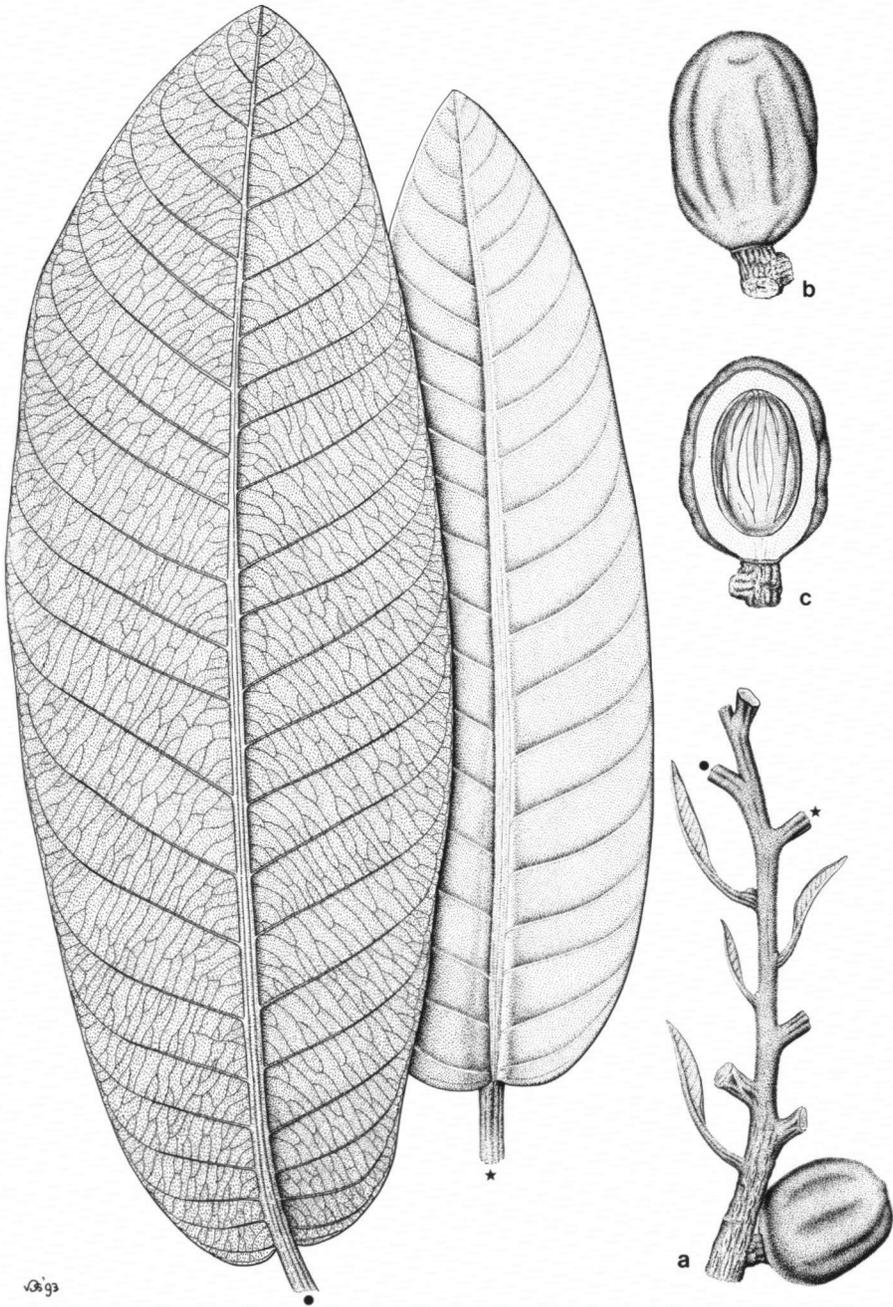


Fig. 9. *Myristica kajewskii* A.C. Smith subsp. *robusta* W.J. de Wilde. a. Top of fruiting twig with a 1-fruited infructescence, fruit immature, leaves attached as indicated by dot and star; b, c. mature fruit as seen from outside and lengthwise opened respectively; all $\times 0.5$ (all from Whitmore BSIP 2981).

KEY TO THE SUBSPECIES

- 1a. Twigs medium or stout; leaves chartaceous or subcoriaceous, lower surface glabrous or with subpersistent tomentum. Infructescences short-stalked. Guadalcanal, San Cristóbal a. subsp. *kajewskii*
- b. Twigs stout; leaves coriaceous, with (sub)persistent rusty scurfy tomentum below. Fruit (sub)sessile on stout woody knob-like infructescences, 1–1.5 cm in diam. Choiseul b. subsp. *robusta*

a. subsp. *kajewskii* — Fig. 8

Distribution – Southern Solomon Islands (Guadalcanal, San Cristóbal).

Habitat & Ecology – Well-drained primary forest of ridges and slopes; (100–) 250–500(–1200) m altitude. Locally common. Flowers and fruit throughout the year.

Vernacular name – Kuku (Kwara'ae lang.).

Notes – 1. Fieldnotes. Erect tree. Leaves shining green. Bole straight. Bark surface smooth, or scaly, or fissured; buttresses absent or present, flying out to 5 ft. Slash bark soft, flecked or banded, red-brown. Slash wood hard or soft, white or light brown. Exudate red, free flowing, not sticky. Flowers cream inside, brown velvety outside. Fruit globular or oval, or lemon-shaped, brown.

2. *Myristica kajewskii* was united with *M. cerifera* by Sinclair, Gard. Bull. Sing. 23 (1968) 412, but these species are kept separate in the present treatment.

3. The male flowering specimen *Whitmore BSIP 4217*, described by Sinclair (l.c.: 513, and fig. 86) under the name *M. petiolata*, belongs to the present species.

4. *Myristica kajewskii* (subsp. *kajewskii*) may be confused with *M. petiolata* because of its long petioles which are coarsely longitudinally grooved when dry. *Myristica petiolata* is closely related, but distinct for instance by much smaller fruit.

5. Specimens from Guadalcanal have a glabrous lower leaf surface, whereas some of the specimens from San Cristóbal, *BSIP 4274*, *12720*, have a short dense rusty (sub)persistent tomentum with minute 'scales' c. 0.1 mm or less, as in subsp. *robusta*. These specimens, with persistent tomentum, may be confused with *M. inutilis* which, in the Solomons, differs by sessile inflorescences and smaller fruit.

6. Possibly also here belongs *Kajewskii 2068*, from Bougainville, found at 1500 m altitude. This material is incomplete in L. As stated above, all other specimens of *M. kajewskii* known to me originate from central and southern Solomon Islands.

Specimens seen. SOLOMONS. *BSIP 4217*, *4274*, *9111*, *9724*, *10118*, *12028*, *12232*, *12720*, *12791*; *Kajewski 2068*, *2613* (T); *Whitmore 2072*.

b. subsp. *robusta* W.J. de Wilde, *subsp. nov.* — Fig. 9

A subspecies *kajewskii* differt habitu robusto, foliis coriaceis subtus tomento (sub)persistenti furfuraceo indutis, infructescentia subsessili lignosa. — Typus: *Whitmore BSIP 2981* (L), Choiseul I.

Twigs stout, at apex 5(–7) mm diam.; bark of older twigs rough, coarsely longitudinally fissured. Leaves stout, coriaceous, below with rusty scurfy tomentum with scale-like hairs c. 0.1 mm, persistent or partly glabrescent, lower leaf surface grey.

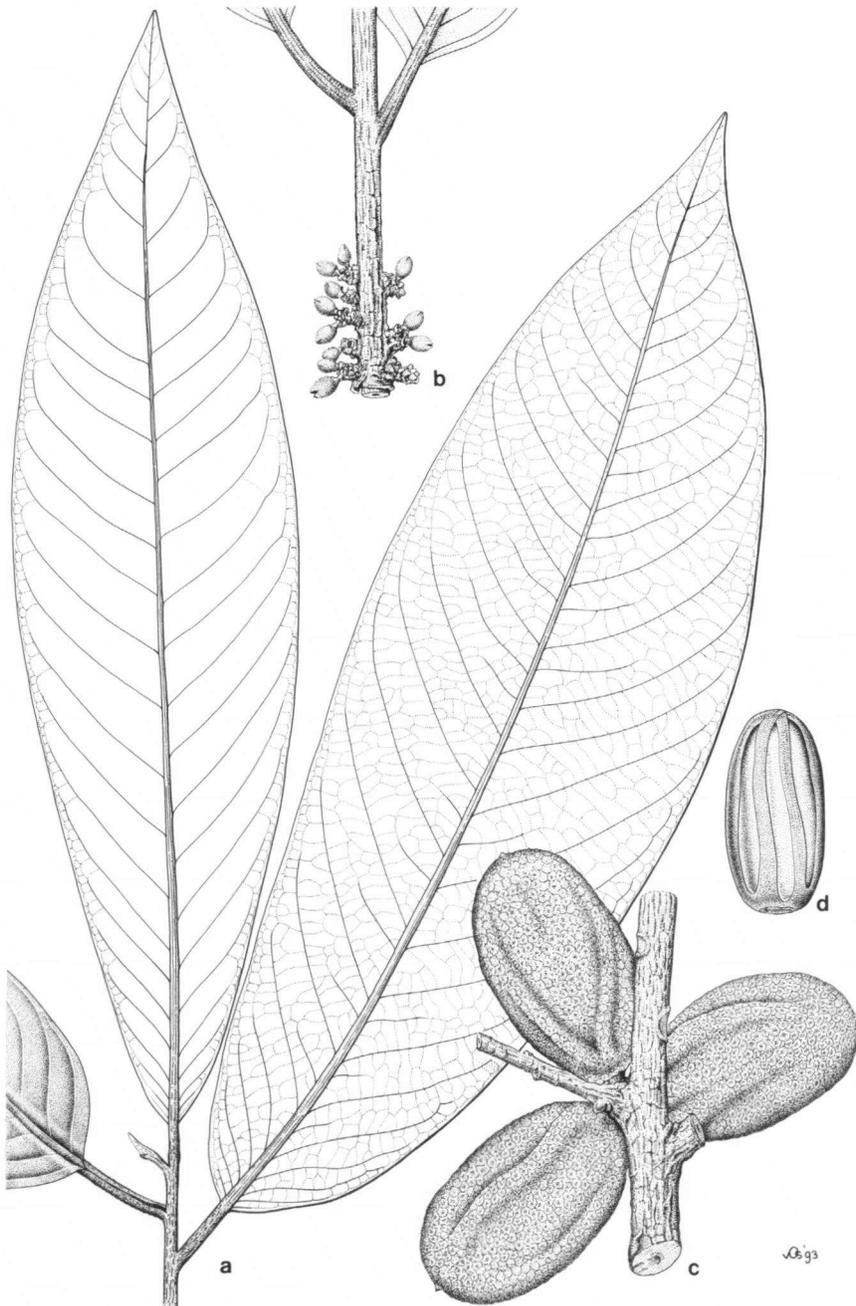


Fig. 10. *Myristica cerifera* A.C. Smith. a. Habit of leafy twig; b. habit of lower portion of leafy twig with male inflorescences; c. portion of branched older twig with infructescence; note warty ornamentation of pericarp; d. seed with deeply lacinate aril; all $\times 0.5$ (a, c: NGF 45604, b: BSIP 16371, d: BSIP 13264).

Male inflorescence, male flowers and female flowers not seen. Inflorescences not or hardly stalked; woody irregularly shaped knobs 1–1.5 cm diam., with 1(–3) sessile fruits. Fruit ovoid-ellipsoid, (when dry) 5–6 cm long, with persistent rusty scurfy pubescence, without lenticels but sometimes with some small cracks towards the top.

Distribution – Central Solomon Islands (Choiseul).

Habitat & Ecology – Primary forest on ridge top; ultrabasic outcrop in forest behind the mangrove; 0–100 m altitude. Fruit in Feb., Oct.

Vernacular name – Kuku (Kwara'ae lang.).

Notes – 1. Fieldnotes. Bole straight; buttresses flying out to 2 ft; bark fissured, dark brown, slash bark soft, slash wood soft, reddish brown; exudate red, free-flowing. Fruit oval, orange or brown, c. 3 by 2 inches.

2. The status of the present taxon is tentative; possibly it represents a species of its own, but pending the study of male flowering material I treat it as a subspecies of *M. kajewskii*, to which it surely is closely related. *Whitmore BSIP 2981* has some characteristic, small, little-developed leaves below the normal leaves on the twig, a feature shared by specimens of the New Guinean *Myristica subcordata* Blume.

3. Known from but two fruiting collections, one recorded as collected in forest on an ultrabasic outcrop; not unlikely the taxon, based on specimens with a conspicuous stout and coriaceous habit, will appear to be restricted to ultrabasic area.

Specimens seen. SOLOMONS. Choiseul: *BSIP 2981* (T), *17528*.

6. *Myristica cerifera* A.C. Smith — Fig. 10

Myristica cerifera A.C. Smith, *J. Arnold Arbor.* 22 (1941)77. — Type: *Kajewski 1827* (A, n.v.; iso L).

Myristica kajewskii auct. non A.C. Smith: Sinclair, *Gard. Bull. Sing.* 28 (1968) 412, 512, p.p., excl. type, excl. f. 70; C.T. White in Walker, *For. Brit. Solomon Is. Protect.* (1948; 2nd ed. 1962) 146.

Tree 7–40 m. *Twigs* medium or stoutish, terete, towards the apex (2–)3–4(–6) mm diam., with minute tomentum, early glabrescent; smooth or finely striate, dark brown, bark of twigs lower down coarsely striate, soon longitudinally cracking and rather coarsely flaking, dark brown or usually pale brown or greyish, usually with small scattered pale-coloured lenticels in younger parts. *Leaves* in two rows; blades (thinly) membranous, elliptic-oblong to oblong-lanceolate, broadest usually at the middle, 15–36(–40) by 6–12(–14) cm, top acute-acuminate, base narrowly or broadly attenuate or ± rounded; upper surface drying bright or dark brown, or blackish brown, lower surface greyish, with tomentum of golden brown appressed hairs (0.1–)0.2–1 mm as present on just expanding leaves, early glabrescent; non-papillose; midrib moderately wide, raised but flat towards the base, nerves 15–25(–30) pairs, at an angle of 45–60° with the midrib, flat or sunken above, dark purplish brown, contrasting below, marginal arches not distinct, tertiary venation fine, forming a coarse, rather contrasting network; petiole medium or stout, 15–30 by 2.5–5 mm, early glabrescent, dark brown, often ± contrasting with the twigs; sterile leaf bud medium, acutish, 10–15 by (2–)3 mm, dull (grey-)brown pubescent with appressed hairs c. 0.1 mm. *Inflorescences* situated usually below the leaves, often distichously crowd-

ed at the base or top of lateral twigs; of the *Knema*-type, i.e. sessile (peduncle up to 2 mm long) simple or forked scar-covered woody brachyblasts, brown pubescent, glabrescent, with or without persisting triangular bracts, coriaceous, 2–3 mm long, brown pubescent; in male: up to 3 cm long, 4–7 mm wide, terminally with a cluster of 3–7 flowers of various age and size; female inflorescences shorter, fewer flowered; flowers with rusty or dark brown tomentum with hairs 0.1–0.2 mm, sometimes partly glabrescent, bracts at the apex of the pedicel, persistent or caducous, perianth lobes splitting the bud for about halfway or slightly over, \pm out-curved at anthesis. *Male flowers*: stout, pedicel often flattened, 2–4 by 2–3 mm, bracteole broadly ovate or triangular, acute, margin ciliate, (3–)4–5 mm long, reaching to \pm halfway the perianth, perianth in bud ovoid or ellipsoid, top (narrowly) rounded, base broadly rounded, 7–9 by 6–7(–8) mm, lobes 3 (or 4), 0.3–0.6 mm thick, splitting the perianth for about halfway; androecium rather short, 5–5.5 mm long, subcylindrical, androphore 1–1.5(–2) by 0.7–1 mm, glabrous, synandrium subcylindrical or slightly tapering downward, 3.5–4 by 1.5–2(–2.5) mm, rounded or subtriangular in transverse section, top truncate, anthers narrow, 9–20 (c. 20–40 thecae), spaced or contiguous, sterile apex hollowed to c. 1 mm deep. *Female flowers*: pedicel 0.5–1 mm long, bracteole 4–5 mm, subcaducous, mature perianth in bud ovoid, 7–9 by 6–7 mm, ovary broadly ovoid, c. 5 by 3.5 mm, densely pubescent with brown hairs 0.5–1 mm long, stigma shallowly 2-lobed, nearly 1 mm long. *Fruit* 1–3(–5) per infructescence, subsessile; fruit stout, ovoid or ellipsoid, or subspherical, 5–7(–8) by (3.5–)4–6 cm, top first acutish or apiculate, pericarp thick, c. 10 mm, brown, with minute brown scurfy tomentum and warty-scaly because of lenticellate cracks and finally forming a rather rectangular pattern, early glabrescent; stalk stout, 2–5 mm long. *Seed* ellipsoid-oblong, 4–5 cm long; aril lobes lengthwise oriented.

Distribution – Northern and central Solomon Islands: Bougainville (incl. Fauro), Choiseul, Santa Isabel (incl. Barora Ite), New Georgia group (Baga, Vella Lavella, Gizo, Kolombangara), Malaita, Nggela.

Habitat & Ecology – Mostly in primary (and secondary) forest on well-drained soil, on crests and hill slopes, also coastal flatland, on limestone, riverbanks, rarely in swamp forest, and on inner edge of mangrove swamps; 0–300(–550) m altitude. Flowers and fruit throughout the year.

Vernacular names – Ookikila (Buin dial., Bougainville), or-wu-pekira (Bougainville), kuka, kuku (Kwara'ae lang.; most common), voraga (Bougainville).

Uses – Pounded seed used for caulking canoes. “Bark used in native charms.”

Notes – 1. Fieldnotes. Erect, rarely crooked tree; bole straight, crown deep, conical, monopodial; branches radial. Leaves midgreen, below white, glaucous, or grey; buttresses absent or various, flying out to 4 ft. Bark surface grey-brown, red-brown, or dark brown, smooth, (finely) fissured, scaly, or flaky; flakes thin or of several layers; slash bark soft, pink or reddish brown, banded or all one colour; exudate pink or red, clear, free flowing or in separate drops, sticky or not; slash wood soft (rarely hard), white, cream, straw, or reddish brown, once cream-flecked salmon, smelling of ripe pears. Flowers cream or yellow, without smell or with sweet smell. Fruit egg-shaped or spherical, (dark) brown, warty.

2. Sinclair (l.c.) regarded the types of *M. kajewskii* and *M. cerifera* identical, choosing *M. kajewskii* as the name used. However, both species are different, and

most specimens belonging to *M. cerifera* were erroneously labelled by Sinclair and later collectors as *M. kajewskii*.

3. *Myristica kajewskii* differs in general habit of the leafy twig, with leaves rather like those of *M. petiolata*, but mainly in the fruit: shortly pubescent, glabrescent, and developing a conspicuously warty surface by many cracks and lenticels in *M. cerifera*; thinly brown pubescent, partly late glabrescent, without coarse lenticels in *M. kajewskii*. *Myristica cerifera* is restricted to the northern and central Solomons, *M. kajewskii* to the southern Solomons, viz. Guadalcanal, San Cristóbal, and Santa Cruz.

Specimens seen. SOLOMONS. BSIP 198, 805, 1373, 2484, 2821, 3030, 3132, 3194, 3500, 3545, 3655, 3792, 4148, 4728, 4797, 5070, 5132, 5187, 5601, 5659, 5685, 5698, 5737, 5829, 5900, 5919, 6429, 6711, 6886, 7103, 7296, 8342, 8528, 8567, 10207, 10320, 10607, 11160, 11355, 11708, 13043, 13090, 13122, 13246, 13342, 13521, 15200, 15832, 16050, 16175, 16234, 16371, 16542, 16585, 16965, 17413, 18608, 18697, 18710, 18761; Craven (& Schodde) 374; Kajewski 1827 (T); NGF 19692, 19694, 45604, 45752; Waterhouse 809.

7. *Myristica xylocarpa* W.J. de Wilde, *spec. nov.* — Figs. 11, 12

A Myristica cerifera et *M. kajewskii* differt fructu sessili, ovoideo-ellipsoideo, in sicco 5–7 cm longo, pericarpio crasso, lignoso, tomento subpersistente pilis c. 1 mm longis induto. — Typus: *Whimore BSIP 2735* (L.), Solomon Islands, Santa Ysabel.

Tree 5–25 m. *Twigs* medium, terete, towards the apex (2–)3–4 mm diam., with minute grey-brown or pale brown appressed hairs 0.1(–0.3) mm, early glabrescent; bark smooth or finely striate, greyish or reddish brown, bark of twigs lower down roughish, irregularly fissured, sometimes shiny, without or with small or coarse brownish lenticels. *Leaves* in two rows; blades membranous or thinly chartaceous, elliptic-oblong to oblong-lanceolate, broadest usually at the middle, 15–25 by 4–10 cm, top acute or acute-acuminate, base attenuate or (narrowly) rounded; upper surface drying olivaceous or (olivaceous-)brown, lower surface grey-brown or olivaceous, glabrous, non-papillose; midrib medium, ± raised but flat towards the base; nerves 18–25 pairs, slender, flat or ± sunken above, only little raised beneath, at an angle of 45–60° with the midrib, marginal arches not distinct, tertiary venation usually faint; petioles medium, 15–30(–35) by 2–3 mm, not coarsely longitudinally grooved on drying, early glabrescent, dark brown; sterile leaf bud medium, acute, 5–15 by 1.5–2.5 mm, densely set with appressed hairs 0.1–0.2 mm, sometimes with additional cataphylls with stout hairs on the margin. *Inflorescences* situated in-between the lower leaves, sessile, of the *Knema*-type, i.e. in male: a small glabrescent simple scar-covered tubercle of 2–4 mm diam., terminally with 2–4(–6) subsessile flowers of various size according to age; bracts small, caducous; flowers including persistent bracteole conspicuously bristly pubescent with dark brown hairs 0.5–0.8(–1) mm. *Male flowers*: pedicel short, up to 0.5 mm long, bracteole ± ovate, top cucullate, c. 2.5 mm long, mature perianth in bud ± ovoid, top narrowly rounded or acutish, 4–4.5 by 2.2–2.5(–3) mm, lobes c. 1.5 mm long, at sutures c. 0.5 mm thick (when dry), i.e. splitting the bud for c. 1/3; androecium c. 2.2 mm long, androphore short, 0.5(–0.6) by 0.5 mm, densely rusty hairy in the lower 4/5 with hairs 0.4–0.5 mm, synandrium subcylindrical, c. 1.5 by (0.6–)0.8 mm, incl. flat-tish sterile apex c. 0.3 mm, anthers 8 or 9 (i.e. c. 16–18 thecae), contiguous, sterile

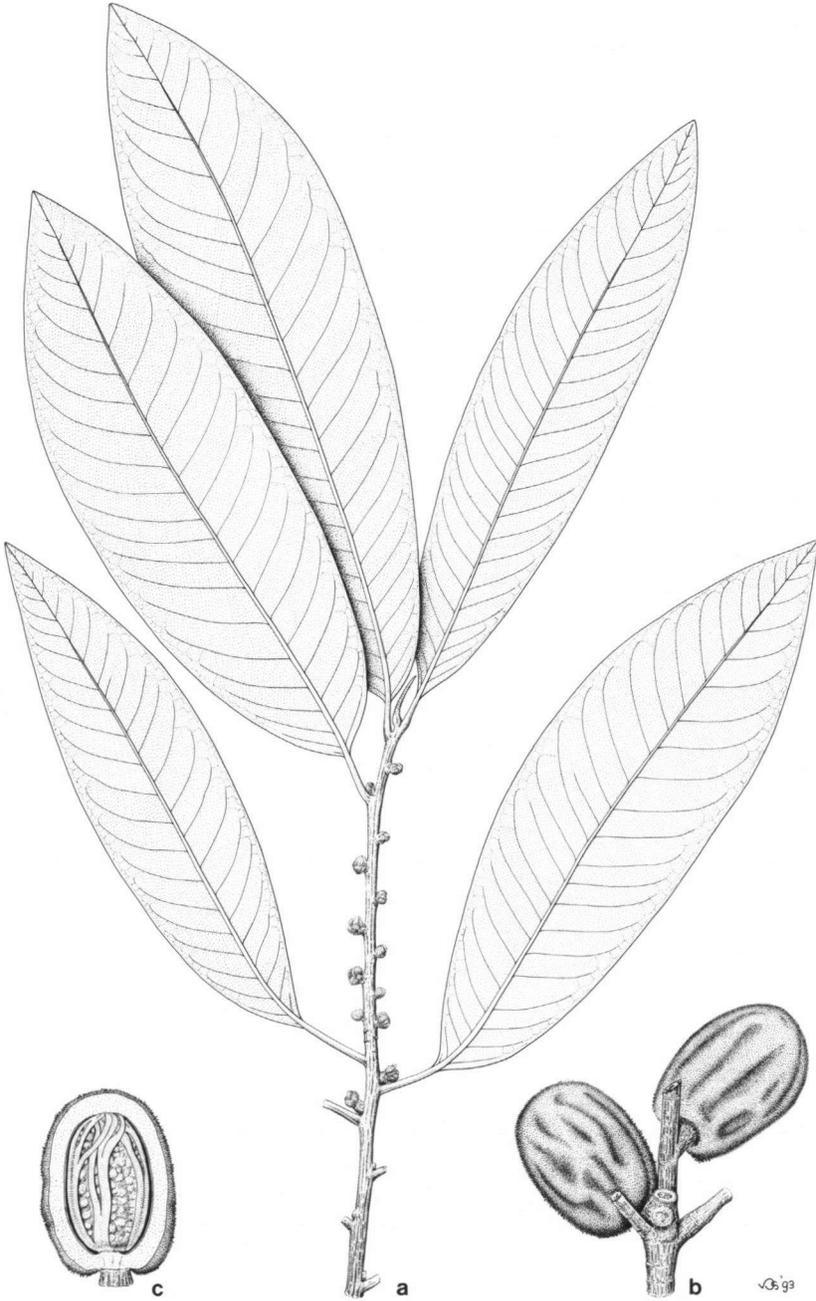


Fig. 11. *Myristica xylocarpa* W.J. de Wilde. a. Habit of leafy twig with male inflorescences (flowers not in anthesis); b. portion of older twig with infructescences; c. mature fruit, opened lengthwise, showing irregularly warty seed, and lacinate aril; all $\times 0.5$ (a: Whitmore BSIP 4074; b, c: Whitmore BSIP 2701).

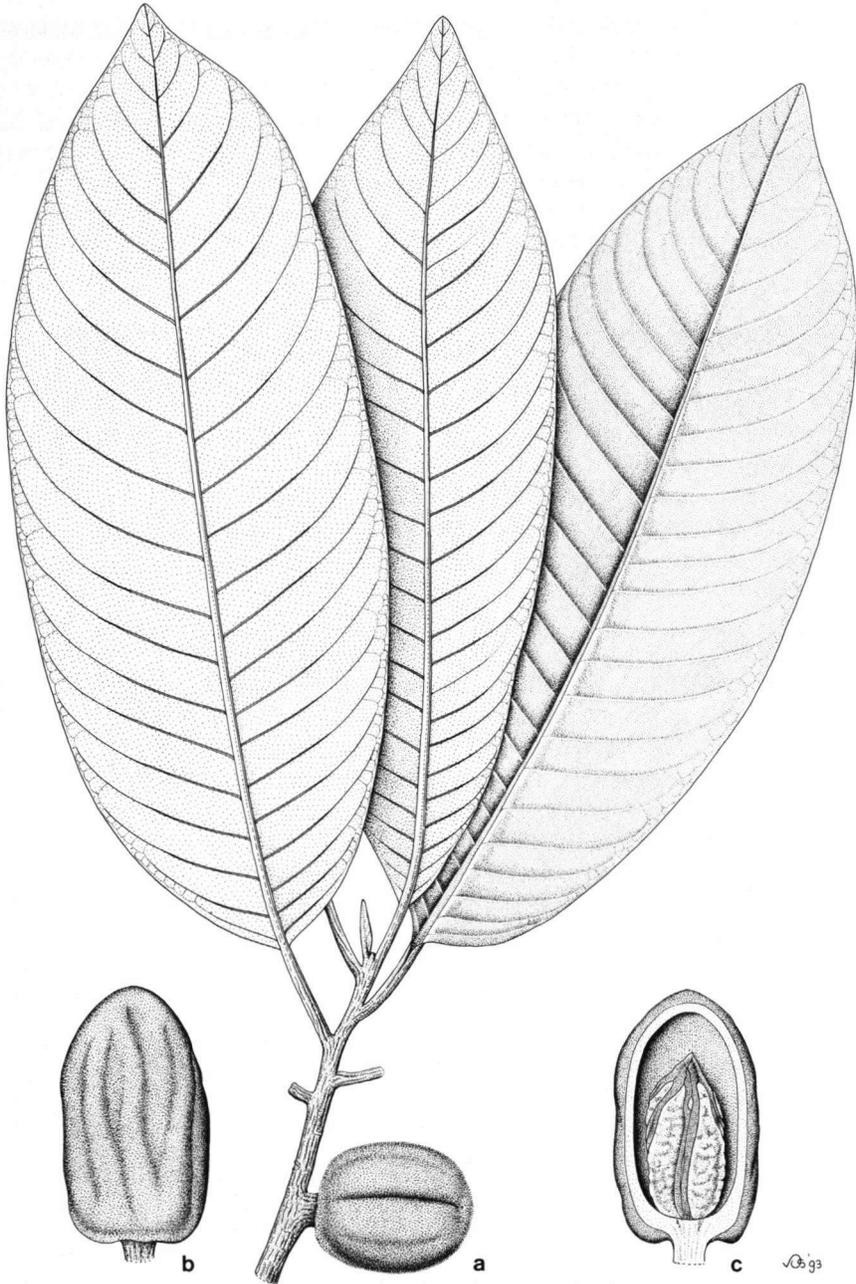


Fig. 12. *Myristica xylocarpa* W.J. de Wilde, specimens with deviating foliage; see note 2. a. Habit of leafy twig with infructescence (one single fruit; immature); b. mature fruit; c. ditto, lengthwise opened, showing bullate-warty seed and aril; note glabrescent pericarp; the bullate-warty seed possibly is characteristic for the species; all $\times 0.5$ (a: Whitmore BSIP 4251; b, c: Boraule & coll. BSIP 9317).

apex with scattered minute stellate hairs 0.1 mm at margin. Female inflorescences or flowers not seen. *Fruits* solitary or 2 (or 3?) together, sessile, ovoid or ovoid-ellipsoid, stout (when dry) 5–7 by 3.5–5 cm, top and base rounded, dry pericarp often woody, c. 10 mm thick, outside with dark brown dense tomentum with hairs 1(–1.5) mm long, subpersistent or often largely glabrescent with tomentum remaining at the very base. *Seed* ± ovoid with coarsely warty or bullate surface, 3–3.5 cm long; aril coarse, the basal part leaving impressions on the seed.

Distribution – Solomon Islands (Santa Ysabel, San Cristóbal, Guadalcanal; see note 2)

Habitat & Ecology – Ridge forest, well-drained forest; 100–250 m altitude. Flowers in March; fruit in May, Sept.–Nov.

Vernacular name – Kuku (Kwara'ae lang.).

Notes – 1. Fieldnotes. Bole straight, buttresses sometimes present; bark dark brown, finely scaly of fissured; slash bark soft or hard, light brown, wood hard or soft, straw; exudate red, free flowing, in drops, not sticky. Fruit brown velvety, egg-shaped; aril pink.

2. Variation. Specimens from Guadalcanal and San Cristóbal, *BSIP* 4251, 9317, 11808, 12592, all in fruit, differ from those of Santa Ysabel (incl. the type) by foliage brighter nerved and broader.

3. Older specimens were identified by Sinclair as *M. fatua* var. *papuana*, but already annotated by the late Mr. Hildebrandt (Leiden) as 'deviating'.

4. Male flowers known from only one collection, *BSIP* 4074, are vegetatively completely identical with the fruiting collections. The male flowers are characteristically strongly dark brown-red rough-pubescent; the pedicel almost absent; the androecium, with mature pollen, is relatively small; the androphore short and strongly pubescent, the sterile apex flattish, rather irregular of shape and provided with sparse minute stellate hairs, rather unique in the genus.

5. Closely related to *M. cerifera* and *M. kajewskii*, the first characteristically differing by warty-lenticellate fruit, the second by a finer tomentum of the fruit, a differing vegetative appearance, etc. In *M. xylocarpa* the petiole is not drying lengthwise coarsely grooved.

Specimens seen. SOLOMONS. *BSIP* 2701, 2735 (T), 2895, 4074, 4251, 7849, 9317, 10937, 11808, 12592, 16008.

8. *Myristica petiolata* A.C. Smith — Fig. 13

Myristica petiolata A.C. Smith, *J. Arnold Arbor.* 22 (1941) 69; Sinclair, *Gard. Bull. Sing.* 23 (1968) 478, f. 85, excl. p. 513, f. 86. — Type: *Brass* 3434A (A holo, n.v.; iso BM, L; BO, BRI, G, SING, n.v.).

Tree c. 20 m tall. *Twigs* subterete, medium stout, towards the apex 3–4 mm diam., coarsely striate and distinctly 2-lined between the bases of the petioles, dull cinnamon or rusty brown, with minute grey-brown tomentum with hairs 0.1 mm or less, early glabrescent; bark of twigs lower down dark brown, coarsely striate, lenticellate, not longitudinally fissured, not flaking. *Leaves* coriaceous; blades oblong or oblong-lanceolate, ± parallel-sided or broadest at or slightly above the middle, 15–

23 by 3–7.5(–9) cm, base attenuate or ± rounded, top acute(-acuminate); upper surface drying olivaceous or bright brown, ± glossy, glabrous, lower surface dull grey-brown or light brown, early glabrescent, not papillose, without scattered dark brown dots; midrib medium or rather broad, above flat in the lower part, raised towards the top; nerves (20–)22–25 pairs, at an angle of 60–75° with the midrib, flat or sunken

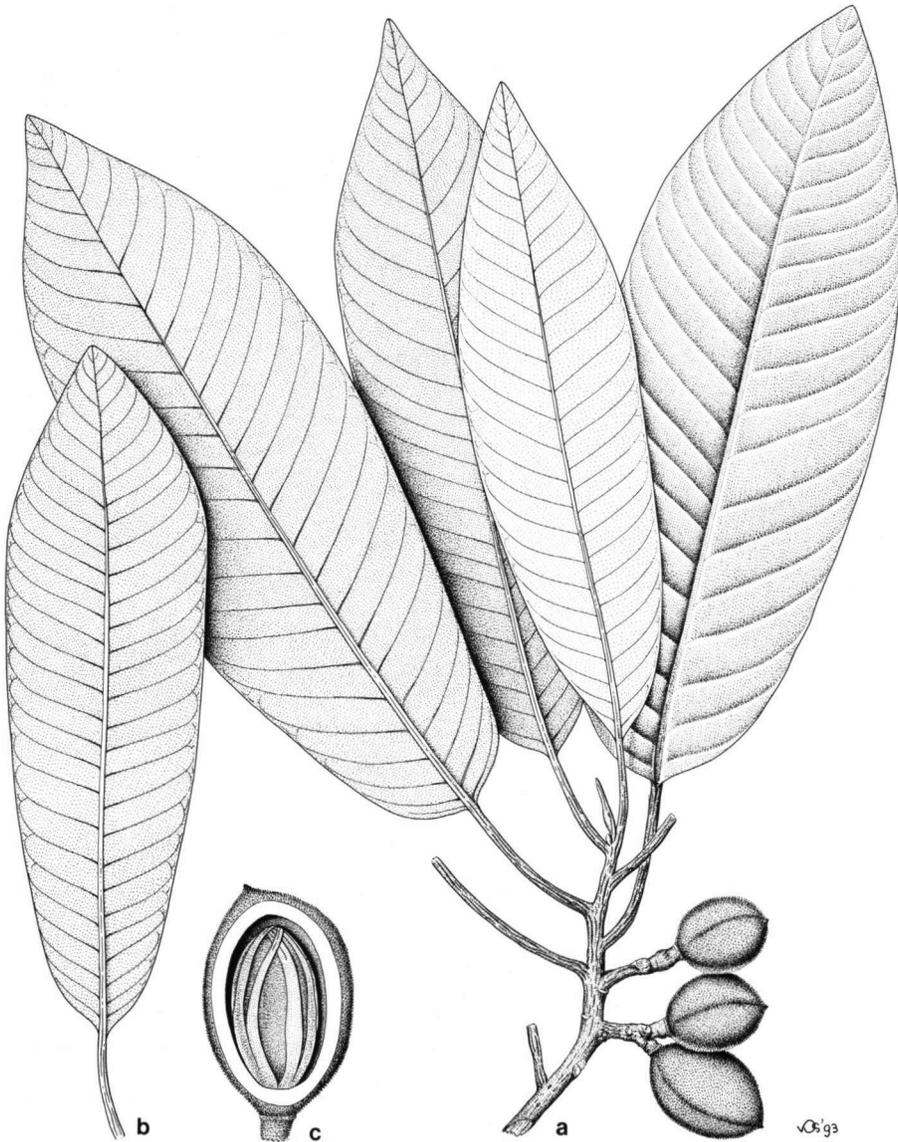


Fig. 13. *Myristica petiolata* A.C. Smith. a. Habit of fruiting twig, fruit mature and nearly mature, $\times 0.5$; b. leaf, seen from below, $\times 0.5$; c. mature fruit, opened to show seed with aril, $\times 0.75$ (a: Brass 3434A, type; b: BSIP 15243).

above, not particularly contrasting below, marginal arches not distinct; tertiary venation moderately distinct or indistinct; petiole medium stout, comparatively long, concolorous with the twig, the surface longitudinally striate as well as wrinkled, 25–60 by 2.5–3.5 mm; terminal sterile leaf bud medium, acute, c. 12 by 2.5 mm, appressed pubescent with (dull) brown or grey-brown hairs 0.1–0.2 mm. *Inflorescences* only known from infructescences: single or paired few-flowered brachyblasts to c. 5 mm long, dark brown pubescent with hairs 0.3(–0.5) mm, glabrescent, carried on a stoutish, slightly flattened common peduncle 5–10(–15) by 4 mm, striate and with a few scattered lenticels. Male and female flowers not known (but see the notes). *Fruit* 1–4 per infructescence; fruiting pedicel pubescent, terete, 2–4 by 4 mm, with the scar of the bracteole c. 1 mm below the fruit; fruit (broadly) ellipsoid, 3–4 by 2–2.8 cm, base rounded, top narrowly rounded and with minute apiculum c. 1(–2) mm; pericarp drying woody, c. 3 mm thick, with densely dark brown, conspicuous, rather coarse tomentum with hairs 1(–2) mm long. *Seed* ellipsoid, 2–2.5 cm long.

Distribution – Solomon Islands (Santa Isabel, Big Nggela Is.).

Habitat & Ecology – Hardwood forest; well-drained, primary ridge-top forest; 50–100 m altitude. Fr. Jan., June.

Vernacular name – Kuku (Kwara'ae lang.).

Notes – 1. Fieldnotes. Recorded as a tree c. 20 m high, or as a tall slender tree; bole straight, buttresses absent, bark dark brown, scaly or slightly fissured; slash wood soft, reddish brown, exudate red, free flowing; fruit brown hairy, or rusty brown; upper surface of leaves smooth and covered with grey bloom, lower surface rusty tomentose (see notes 2 & 3).

2. I prefer to restrict the name *M. petiolata* to the type-collection *Brass 3434A*, and one additional specimen from Big Nggela, *BSIP 15243*. Both have a very similar habit with glossy, completely glabrous leaves. Both have mature fruit. The flowering specimen, as added by Sinclair (l.c.: 513, f. 86) has the leaves scaly-hairy below and is now referred to *M. kajewskii*.

3. Brass stated on the field label, regarding the leaves, “lower surface rusty tomentose”, but obviously this annotation belongs to *Brass 3434*, the type of *M. procera*, which is at present a synonym under *M. inutilis*.

Specimens seen. SOLOMONS. *Brass 3434A* (T); *BSIP 15243*.

9. *Myristica hypargyraea* A. Gray — Fig. 14

Myristica hypargyraea A. Gray in Wilkes, U. S. Explor. Exped. 1. (1854) 33, p. p. (Samoan specimens only); A. DC., Prod. 14, 1 (1856) 194, p. p.; Seemann, Fl. Vitiensis (1867) 205, p. p.; Warb., Monogr. Myrist. (1897) 479, t. 18 f. 1–5, p. p.; Reching, Denkschr. Akad. Wiss. Wien. Math.-Natw. Kl. 84 (1908) 485 (*'hypargyraea'*); ibid. 85 (1910) 282, p. p.; Kanehira, Tokyo Bot. Mag. 45 (1931) 280; Fl. Micron. (1933) 113, f. 34; Enum. Micron. Pl. in J. Dept. Agr. Kyushu Imp. Univ. 4, 6 (1935) 319; Christophersen, Bish. Mus. Bull. 128 (1935) 86; Markgraf, Bot. Jahrb. 69 (1938) 397, excl. spec. from Fiji; A. C. Smith, Bull. Torrey Bot. Club 68 (1941) 403 (incl. spec. from Tonga); Sinclair, Gard. Bull. Sing. 23 (1968) 415 (excl. vars. p. p.), f. 71 — Type: *Pickering s. n.*, Capt. Wilkes Exp., Samoa (K; A, NY, P, US, n.v.).

Tree 5–10(–30) m tall. *Twigs* generally stoutish, terete, towards the apex 2.5–5(–7) mm diam., with minute grey or grey-brown tomentum, hairs 0.1–0.2 mm or less,

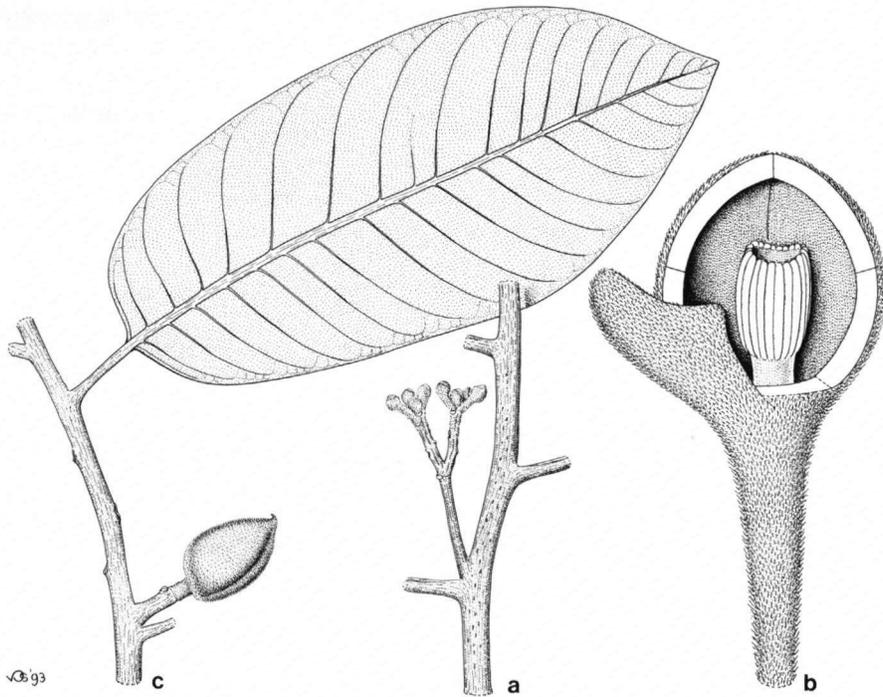


Fig. 14. *Myristica hypargyrea* A. Gray subsp. *hypargyrea*. a. Portion of male flowering twig with inflorescence, $\times 0.5$; b. opened male flower at near-anthesis; note persistent bracteole and flat or hollowed apex of synandrium, $\times 5$; c. portion of leafy twig with one-fruited infructescence; note peduncled infructescence, the fruit is in the dried state, mature, $\times 0.5$ (a, b: Bristol 2262; c: Bristol 2025).

glabrescent, finely striate; bark of twigs lower down bright or grey brown, striate, finely lenticellate, lenticels contrasting or not, bark not cracking, not flaking. *Leaves* medium or large, membranous or chartaceous; blades elliptic-oblong to oblong, broadest at or slightly above the middle, 17–40 by 7–18 cm, base short-attenuate or mostly rounded or shallowly cordate, top acute or slightly acute-acuminate; upper surface drying olivaceous, lower surface whitish, pale greyish or grey-green, with scattered very minute whitish appressed hairs, early glabrescent, not papillose, without dark-coloured dots; midrib comparatively slender, flat or slightly raised above, light brown or yellowish, or chestnut contrasting below; nerves 15–25 per side, at an angle of 50–70° with the midrib, slender, flat or slightly raised or usually slightly sunken above, marginal arches rather distinct; tertiary venation forming a coarse network often \pm trabeculate, fine, well-visible or not; petiole stout, glabrous (early glabrescent), short or long; sterile apical leaf bud rather slender, acute, 10–15 by 2–2.5 mm, densely light brown or greyish appressed-pubescent with hairs 0.2–0.3 mm or less. *Inflorescences* situated in-between the (lower) leaves; in male: with a stoutish common peduncle, subterete, 10–25(–35) mm long, 2–2.5 mm wide, striate, to-

mentum with rusty hairs 0.5–1 mm, glabrescent, the peduncle ending in a single flower and with two lateral branches, erecto-patent up to 20 mm long with scars of fallen flowers and each arm ending in a cluster of 2–6 flowers of various age and size, scars dispersed, apparently without scars of bracts; flowers pubescent with hairs (0.2–)0.3–0.5 mm, rusty or partly greyish, bracteole large, at apex of pedicel; female inflorescences essentially as male, smaller and fewer-flowered, common peduncle 5–10 mm long. *Male flowers*: pedicel medium or stoutish, 6–7 mm long, 1.5–2 mm wide at the top, bracteole large, broadly ovate or half-circular, top broadly rounded or faintly bluntly 3-topped, 4–5 by 5 mm, \pm persistent; perianth broadly ovoid, c. 6 by 5 mm, perianth carinose or coriaceous, valves c. 0.5 mm thick at sutures, 3(–4) mm long, i.e. splitting the perianth for about halfway or slightly over; androecium broadly cylindrical, 3–4.5 by 2 mm; synandrium broadly cylindrical, 2.5–3 by 2 mm, the top widened, usually somewhat depressed in the centre, i.e. projecting sterile apex absent, anthers 11–18 (fide Smith, 1941), rather spaced, sometimes synandrium narrower with fewer anthers; androphore short, 1–1.5 by 0.8–1 mm, glabrous or with a few pale hairs 0.2–0.3 mm at base. Mature female flowers not seen. *Fruit* solitary; fruiting pedicel 5–8 by 3–5 mm, striate, sometimes lenticellate, dry fruit \pm ovoid, 3–4.5 by 2–3 cm (but see note 4 under subsp. *hypargyraea*), base broadly rounded, top usually apiculate (when dry), pericarp 3–5 mm thick, tomentum dense, felt-like, dark brown or rusty, with hairs 0.2–0.5 mm long, sometimes minutely warty (fide Sinclair). *Seed* broadly ellipsoid, 2(–2.5) cm long.

Distribution – Two subspecies, the type subspecies in Samoa-Tonga Islands, the other in the Caroline Islands.

KEY TO THE SUBSPECIES

- 1a. Leaves often (broadly) obovate; leaf apex broadly acute or bluntish; petiole comparatively short, 10–15 mm long. Anthers 11–18. Fruit (ellipsoid-)oblong, 4–4.5 cm long (when dry). Caroline Islands **b. subsp. insularis**
- b. Leaves generally elliptic-oblong; leaf apex acute or acute-acuminate; petiole long, (1.5–)2–5 cm long. Anthers 11 or 12. Dry fruit broadly ovoid, 3–3.5 cm long. Samoa, Tonga Islands **a. subsp. hypargyraea**

a. subsp. hypargyraea

Distribution – Samoa (Savaii, Upolu, Tuluila), Tonga Islands.

Habitat & Ecology – Forest at 100–350 m altitude. Flowers and fruit apparently throughout the year.

Notes – 1. Fieldnotes. Tree 5–10 m. Leaves large, dark green above, grey-green below. Wood very hard, bark bleeding reddish brown. Branches high-up. Flowers brown; fruit brown; aril (immature?) yellow-orange or red, with many fine laciniations.

2. The material from Tonga, as enumerated by Sinclair (l.c.) (not seen by me) under *M. hypargyraea* var. *gillespieana* is, in agreement with A.C. Smith (Fl. Vit. Nova 2, 1981, 51) rather to be referred to *M. hypargyraea*.

3. The bracts in the male inflorescences (e.g. in *Reinecke 133*, *Bristol 2262*) are very minute, the flower pedicels leaving conspicuous round scars without trace of the scar of the subtending bracts, suggesting as if bracts were altogether absent.

4. Mature fruit in spirit (*Spence 488*) measures 5.5–6 by 4 cm, whereas that in dried specimens only is c. 3(–3.5) cm long.

5. I have not seen mature female flowers. Sinclair described the female flowers as deeply lobed, 5 mm long; ovary globose, densely rusty-tomentose; pedicel 5 mm long, 2–2.5 mm thick.

Specimens seen. SAMOA. *Bristol 2035, 2262; Christophersen 3203; McKee 2876; Reinecke 133; Spence 488.*

b. subsp. *insularis* (Kanehira) W.J. de Wilde, *stat. nov.*

Myristica insularis Kanehira, Fl. Micronesica (30 June, 1933) 115, f. 35; Bot. Mag. Tokyo 47 (20 Oct., 1933) 671; Enum. Micron. Pl. in J. Dept. Agr. Kyushu Imp. Univ. 4, 6 (1935) 320; Markgraf, Bot. Jahrb. 69 (1938) 397; A.C. Smith, Bull. Torrey Bot. Club 68 (1941) 402. — *Myristica hypargyraea* A. Gray var. *insularis* (Kanehira) Sinclair, Gard. Bull. Sing. 23 (1968) 422, f. 74.

Myristica hypargyraea auct. non A. Gray, p.p. (for the specimens from Micronesia only): Kanehira, Bot. Mag. Tokyo 45 (1931) 280; Fl. Micronesica (1933) 113, f. 34; Markgraf, Bot. Jahrb. 69 (1938) 397; Glassmann, Fl. Ponape in Bish. Mus. Bull. 209 (1952) 53. — Type: *Kanehira 1865* (FU holo, n.v.; iso K; NY, P, TNS, n.v.).

Distribution – Caroline Islands (Palau and Ponape).

Habitat & Ecology – Forest; up to 300 m altitude.

Vernacular names – Ka'rara', kararah, karala.

Notes – 1. Fieldnote. Locally common on Ponape. Flowers cream-coloured inside.

2. Sinclair accepted *M. hypargyraea* A. Gray in a very broad sense, including *M. insularis*, *M. gillespieana* and *M. guillauminiana*, which are held up as varieties. I follow A.C. Smith in regarding the latter two as good species. Although I have seen only limited material, I feel that *M. insularis* stays comparatively much closer to typical *M. hypargyraea* and therefore I have treated it as a subspecies beside the type subspecies, both being geographically separated.

3. According to A.C. Smith (1941) *M. insularis* differs from *M. hypargyraea* in general leaf-shape characters but especially by the type of the pubescence of the staminate inflorescences; this latter difference was refuted by Sinclair (1968: 425, 426).

Specimens seen. CAROLINES. Ponape: *Masahiko Takamatsu 1023; Stone 5446.*

10. *Myristica guillauminiana* A.C. Smith — Fig. 15

Myristica guillauminiana A.C. Smith, Bull. Torrey Bot. Club 68 (1941) 405. — *Myristica hypargyraea* A. Gray var. *guillauminiana* (A.C. Smith) Sinclair, Gard. Bull. Sing. 23 (1968) 420, f. 73. — *Myristica* sp., Guillaumin, J. Arnold Arbor. 13 (1932) 83. — Type: *Kajewski 422* (K; A, BRI, NY, n.v.).

Tree 10–25 m. *Twigs* subterete, medium (to stoutish), towards the apex 2–4 mm diam., finely striate, dark brown, with very minute bright yellowish-rusty tomentum,



Fig. 15. *Myristica guillauminiana* A.C. Smith. Habit of leafy twig with inflorescence with mature fruit, $\times 0.5$ (Whitmore BSIP 1801A).

hairs 0.1 mm or less, early glabrescent; bark of twigs lower down coarsely striate, with scattered lenticels, not contrasting and rather inconspicuous, bark not cracking, not flaking. *Leaves* membranous or thinly chartaceous; blades elliptic, or obovate-oblong, or elliptic-oblong, 15–26 by 5–9.5 cm, base attenuate or rounded, top acute or subobtusate; upper surface drying olivaceous-brown or (reddish) brown, or dark brown, lower surface with rather loose tomentum with rusty stellate hairs 0.1 mm or less, early glabrescent (i. e. glabrous), leaving a grey-brown (strongly) papillose surface; no scattered larger dark-coloured dots present; midrib medium, (flat or) slightly raised above; nerves 15–22 per side, flat or sunken above, reddish brown, contrasting below, at an angle of 45–60(–70)° with the midrib, marginal arches ± distinct or indistinct, tertiary venation reticulate (or ± trabeculate), fine, distinct or indistinct below; petiole medium, glabrous, dark brown, 15–30 by 2–3 mm; terminal sterile leaf bud medium, acute, 12–15 by (2–)3 mm, minutely rusty appressed pubescent with hairs c. 0.1 mm. *Female inflorescences* (infructescences) in the axils of the lower leaves or just below, short, few-flowered, puberulous, glabrescent. Male inflorescences, male flowers, and female flowers (but see notes 3 and 4) not seen. *Fruit* solitary or 2 or 3 together; on a woody wart-like infructescence (*Knema*-type), 2–5 mm diam.; fruiting pedicel 2–5 mm long, 3–4 mm thick, sometimes with small lenticels, the scar of the bracteole close to the fruit; fruit broadly ellipsoid or subglobose, 2.5–3.5 by 2.2–3 cm, top often 2 mm beaked, pericarp thin, (dry) 1–2 mm thick, shortly dense, almost ‘mealy’ rusty pubescent with hairs 0.1–0.3 (–0.5) mm. *Seed* subglobose, (2–)2.5–3 by 2–2.5 cm.

Distribution – Vanua Levu Islands (Banks group of the New Hebrides), Vanikoro and E & NE Santa Cruz (Santa Cruz group).

Habitat & Ecology – Well-drained primary and secondary forest of hillsides and ridges; 0–200 m altitude; locally common near sea level. Fruit March–May, Oct.; flowers Oct.

Vernacular names – Nanae (Nambalua, Vanikoro Is.); kuku (Kwara’ae, Malaita).

Notes – 1. Fieldnotes. Medium erect or crooked tree, 40–60 ft tall; girth to 3–4 ft, buttresses absent or present, flying out to 3 ft; crown dense, small, or heavy, the branches slightly ascending. Bole smooth. Bark smooth with fine, close, superficial fissures, distant, or slightly scaly, grey-brown or dark brown, with some microlichen flecks. The slash bark is soft, banded, dark red; the slash wood white turning pink or red; bark red-brown, fibrous or loosely fibrous, a little pale red thin exudate. Fruit globose, golden, or reddish brown, tomentose, dehiscent; aril red; seed olive. Leaves glaucous below; midrib yellow, veins yellow. Aril also recorded as yellow green for seemingly mature fruit. The living fruit (*Kajewskii* 422) measures 4.5 by 4 cm.

2. This species was included at varietal rank under *M. hypargyraea* by Sinclair, but it certainly does not belong there; our present species is markedly different by the strongly papillose undersurface of the leaves. Other marked differences are in the fruit, which is almost globose, with thin pericarp when dry, and shorter haired than in *M. hypargyraea*.

3. Although (male) inflorescences are not known, these most likely are of the *Knema*-type.

4. *BSIP 17698* with immature fruit, in L with 3 fruits in a single infructescence which bears in addition a small female flower in anthesis: pedicel c. 0.5 mm long; bracts and bracteoles caducous; perianth ovoid, c. 3 by 2.5 mm, the lobes c. 1 mm long, out-curved; ovary subglobose-ovoid, c. 1.5 mm. Possibly this belatedly flowering female flower is atypical as regards its size.

Specimens seen. SOLOMONS. *BSIP 1622, 1726, 1801A, 7010, 17010* (T), *17698*.

11. *Myristica gillespieana* A.C. Smith — Fig. 16

Myristica gillespieana A.C. Smith, Bish. Mus. Bull. 141 (1936) 67, f. 32; Bull. Torrey Bot. Club 68 (1941) 404; Fl. Vit. Nova 2 (1981) 46, f. 19. — *Myristica hypargyrea* A. Gray var. *gillespieana* (A.C. Smith) Sinclair, Gard. Bull. Sing. 23 (1968) 418, f. 72. — For some misapplications see A.C. Smith (1981). — Type: *Smith 946* (BISH, n.v.; iso several, n.v.).

Tree 5–30 m. *Twigs* medium, subterete, towards the apex (2.5–)3–4 mm diam., grey-brown, with minute greyish or rusty tomentum, hairs 0.1–0.2 mm, early glabrescent, coarsely striate bark of twigs lower down grey-brown, coarsely striate, rough by longitudinal cracks and many lenticels not much contrasting of colour, older bark not flaking. *Leaves* in two rows; blades membranous or chartaceous, elliptic-oblong or oblong, \pm parallel-sided or broadest above the middle, 10–19 by 4–9 cm, base (narrowly) rounded or shallowly cordate, top acute-acuminate or sometimes bluntish; upper surface drying dull olivaceous, glabrous, lower surface greyish or whitish, early glabrescent, not papillose, no scattered larger dark brown dots present; midrib rather slender, flattish or somewhat raised above; nerves slender, 15–22 pairs, at an angle of 60–80° with the midrib; tertiary venation slender, somewhat trabeculate or netted, level below, flat or faintly impressed above, often indistinct on both surfaces; petiole medium or longish, dark brown, glabrous, 20–30 by 2–2.5 mm; terminal leaf bud rather slender, acute, c. 10 by 2–3 mm, densely greyish brown appressed pubescent with hairs c. 0.1 mm. *Inflorescences* nearly of the *Knema*-type, i.e. usually with smooth non scar-covered common peduncle (3–) 5–10 mm long, 3–4 mm thick, blackish brown, glabrous, with few small lenticels, proceeding into simple or forked (rarely 3-armed) scar-covered flower-bearing brachyblast up to 15 mm long, 4–5 mm wide, minutely greyish brown pubescent with hairs 0.1–0.4 mm, glabrescent; male and female inflorescences essentially similar. *Flowers* short greyish or pale brown pubescent with hairs 0.1–0.3 mm, in male 2–5 clustered at the end of the brachyblast, of various size and age, in female somewhat fewer-flowered; bracteole apical on the pedicel, persistent. *Male flowers* (not seen, described according to A.C. Smith, 1941, and the photographs of fresh material, Smith, 1981: f. 19): pedicel (4–)5–6 mm long, c. 1 mm thick, bracteole broadly ovate, 3–5 mm long; mature perianth carnose, in bud broadly ovoid, (3.5–)4–6 by 3–3.5 mm, lobes 1.5–2 mm long, hence splitting the perianth for about 1/3 to nearly halfway; androecium broad-cylindrical, c. 3 mm long; synandrium broad-cylindrical, c. 2.5 mm long, c. 1 mm wide, anthers 4–6 (i.e. 8–12 thecae), rather spaced; sterile apex absent; androphore short, c. 0.5 mm long, minutely strigillose or glabrous. *Female flowers* (A.C. Smith 7271) carnose, grey-white, 'felty' pubescent with hairs 0.1–0.3 mm; pedicel 2.5 mm, bracteole c. 3.5 mm long, \pm cucullate, ma-

ture perianth in bud ovoid, c. 4.5 by 3–3.5 mm, lobes c. 1.5(–2) mm, ovary ovoid, densely greyish or ferrugineous strigose with hairs c. 0.5 mm long; incl. stigma c. 3 mm long. *Fruit* solitary or mostly paired, on thickened woody, scabrous, knob-like simple or forked infructescences, to 2 cm long, 1.5 cm diam.; fruiting pedicel (5–) 7–10 mm long, 6–9 mm thick, coarsely fissured and pustulate by lenticels; fruit \pm ellipsoid or spindle-shaped with top narrowed into an up to 5 mm long beak, base tapered into a 3–10 mm long pseudostalk, in all 5–6 by 3–4 cm; (dry) pericarp c. 3



Fig. 16. *Myristica gillespieana* A.C. Smith. a. Habit of leafy twig with female inflorescence; b. infructescence; both $\times 0.5$ (a: A. C. Smith 7271; b: A. C. Smith 7048).

mm thick, outside dull grey-brown or brown 'felty' pubescent with hairs (0.1–)0.5 mm long. *Seed* broadly ellipsoid, 2.5–3 cm long.

Distribution – Endemic to Fiji: apparently the most widely distributed species, according to Smith (1981) recorded for Viti Levu, Kanadavu, Ovalau, Moturiki, Koro, Vanua Levu, Vanua Mbalavu.

Habitat & Ecology – Dense forest; at c. 10–600 m altitude. Flowers and fruit throughout the year.

Vernacular names – Kau ndamu, male, kali, kole. According to A.C. Smith (1981) the commonly used names for *M. gillespieana*, as for its relatives, are male, kali, kale, and kau ndamu; less frequently recorded are the names kali male ndina, and kau ndamu vula.

Uses – Useful timber tree, suitable for building and furniture (Smith, 1981).

Notes – 1. Fieldnotes. Tree to 30 m; with horizontal branches; trunk c. 70 cm diam. Bark with thin reddish latex. Female perianth green within, greyish pilose without. Fruit brown, aril bright red; the fruit may reach a length of 7 cm.

2. The specimen A.C. Smith 8601, from Viti Levu, is deviating. It was named by Smith on the herbarium label as *M. castaneifolia*, but cited in Fl. Vit. Nova 2 (1981) 46 under *M. gillespieana*. The leaves are slightly different from *M. gillespieana* in shape, but are markedly different by the papillose undersurface. The fruit is mature, smaller than in typical *M. gillespieana*, c. 3 by 2.5 cm, and with red-brown-rusty short tomentum, not greyish brown as in *M. gillespieana*. Possibly the specimen is an hybrid with *M. ascmithii* or represents a separate taxon.

3. Sinclair treated this taxon as a variety of *M. hypargyrea*; I agree that this species is close to *M. hypargyrea* but feel that A.C. Smith is correct by treating it as a separate species; especially the fruit is quite distinctive.

4. According to Smith (1981) the specimens from Tonga, as cited by Sinclair, can better be referred to *M. hypargyrea*; I have not seen these specimens.

Specimens seen. FIJI. Parks 70934; A.C. Smith 7048, 7271, 8601, 8999.

12. *Myristica chartacea* Gillespie — Fig. 17

Myristica chartacea Gillespie, Bish. Mus. Bull. 83 (1931) 5, f. 2; A.C. Smith, Bish. Mus. Bull. 141 (1936) 66; Bull. Torrey Bot. Club 68 (1941) 401; Parham, Plants Fiji. Is. (1964) 59; ed. 2 (1972) 92; A.C. Smith, Fl. Vit. Nova 2 (1981) 51, f. 20. — Type: *Gillespie 4206* (BISH, n.v.). *Myristica hornei* Warb., Monogr. Myrist. (1897) 107, 494, nom. nud. (*Horne 966*, from Viti Levu, A; K, n.v.); see also A.C. Smith, Bull. Torrey Bot. Club 68 (1941) 406.

Tree 4–24 m. *Twigs* slender or medium, terete, towards the apex (1–)1.5–2(–3) mm diam., finely or coarsely striate, with minute (pale) brown or grey-white tomentum, hairs 0.1 mm or less, early glabrescent; bark of twigs lower down dark brown or grey brown, coarsely striate, lenticels small, not contrasting and inconspicuous. *Leaves* small; blades (thinly) chartaceous, elliptic-oblong to oblong, 6–11(–15) by 2–5.5(–7) cm, broadest at about the middle, base attenuate or rounded, top acute or faintly acute-acuminate, the tip bluntish; upper surface drying olivaceous or brown, glabrous, lower surface pale brown, early glabrescent, not papillose, without dark brown (non traumatic) dots; midrib slender, flattish or somewhat raised above; nerves

15–25 pairs, densely set, at an angle of 60–80° with the midrib, flat on both surfaces, slender, inconspicuous; marginal arches and reticulation fine, little visible, sometimes impressed above; petiole slender, reddish brown or dark brown, glabrous, 10–22(–25) by 1.5–2(–2.5) mm; terminal sterile leaf bud small, slender, acute (5–

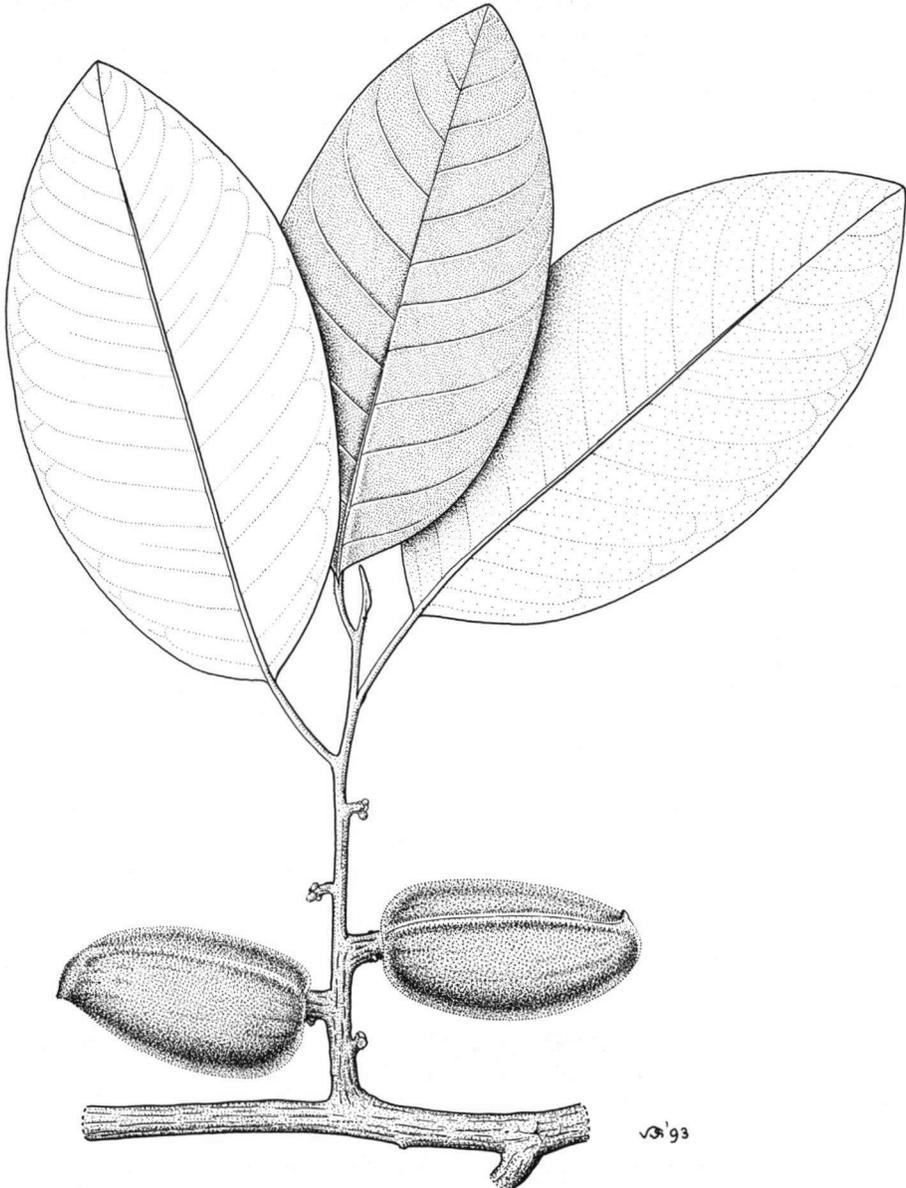


Fig. 17. *Myristica chartacea* Gillespie. Leafy twig with two one-fruited infructescences, $\times 1$ (A. C. Smith 8777).

7–10 by 1–1.5 mm, minutely rusty or grey-brown appressed pubescent with hairs 0.1 mm or less. *Inflorescences* situated in-between and below the leaves, of a somewhat mixed nature, i.e. predominantly of the *Knema*-type, i.e. a simple or shortly forked scar-covered brachyblast up to 5 mm long, thinly brown-pubescent, subsessile or at the end of an up to 3 mm non scar-covered common peduncle; flowers at the end of the brachyblasts, thinly pubescent with dull rusty hairs 0.1(–0.2) mm, in male with 5–10 flowers of various age and size, female inflorescences 1–4-flowered; bracteole at apex of the pedicel, (late-)caducous. *Male flowers*: pedicel slender or moderately stout, not much tapering, (2–)3–4 mm long, bracteole ovate, 2–2.5(–3) mm long, caducous, attached at apex of pedicel; perianth rather membranous 0.2(–0.3) mm thick, ovate or ovate-ellipsoid, c. 5 by 3(–3.5) mm, lobes c. 1.5 mm, i.e. splitting the perianth for c. 1/3; androecium c. 4 by 0.8 mm; synandrium cylindrical, 2–2.3(–2.5) by 0.8(–1) mm including minutely lobed bluntish sterile apex 0.1–0.2(–0.3) mm, anthers 6–8, contiguous or \pm spaced; androphore cylindrical, c. 1.7 by 0.5 mm, glabrous or minutely pubescent. *Female flowers* (according to Smith, 1981): pedicel c. 1–1.5 mm long, bracteole caducous, mature perianth in bud ovoid, c. 4–5.5 by 4–4.5 mm, lobes c. 2 mm, out-curved at anthesis, ovary ovoid, 3.5–4.5 mm long, densely pubescent, stigma-lobes minutely lobulate. *Fruit* solitary or paired, below the leaves; fruiting peduncle (incl. knob-like sessile or short-peduncled inflorescence) 3–6 by 3–4 mm; fruit ovoid-ellipsoid or mostly ovoid-oblong, (2.5[see note 3]–)4–4.5 by 2–2.5 cm, base \pm truncate, top narrowly rounded or subacute, with small oblique beak, dry pericarp c. 3(–4) mm thick, minutely rusty pubescent with hairs 0.1(–0.2) mm. *Seed* ellipsoid, (2–)2.5–3 cm long.

Distribution – Fiji Islands: Viti Levu, Vanua Levu, Ngau, Ovalau. Smith (1981) cited 22 representative collections.

Habitat & Ecology – Dense forest; dense ridge forest; rather dry forest; 50–900 m altitude. Flowers and fruit throughout the year. Seeds eaten by pigeons.

Vernacular names – Male, kau ndamu male, yawe (?); see also Smith (1981).

Uses – The species is considered a useful timber tree (Smith, 1981).

Notes – 1. Fieldnotes. Slender tree to 20 m, trunk to 50 cm diam. Flowers yellowish with rust-brown tomentum, or brown. Fruit dull green with brown pubescence or yellowish, aril salmon-pink or scarlet; seeds eaten by pigeons.

2. Smith (1981) presented photographs of opened male and female flowers in the fresh state.

3. The collection *Parham 15112* from Vanua Levu is aberrant because of its fruit which is smaller than usual, only c. 2.2–2.5 by 1.7–1.8 cm; it contains apparently mature seed. More similar material is needed for conclusions about the taxonomy of this smaller-fruited form.

Specimens seen. FIJI. *Damanu* FD 1112, 1113; *Degener* 15289; *Degener & Ordones* 14134; *Parham* 15112; *Parks* 20457; A. C. *Smith* 5842, 7163, 7634, 7763, 8455, 8777, 9114.

13. *Myristica acsmithii* W.J. de Wilde, *spec. nov.* — Fig. 18

A Myristica castaneifolia differt habitu gracili, ramulis apice 2(–3) mm diam., foliis 9–14 cm longis, fructu late ellipsoideo 2.5–3.5 cm longo, pedicello 2–5 mm longo, c. 5 mm crasso, grosse lenticellato et fisso. — Typus: A. C. *Smith* 7161 (L), Fiji, Viti Levu.

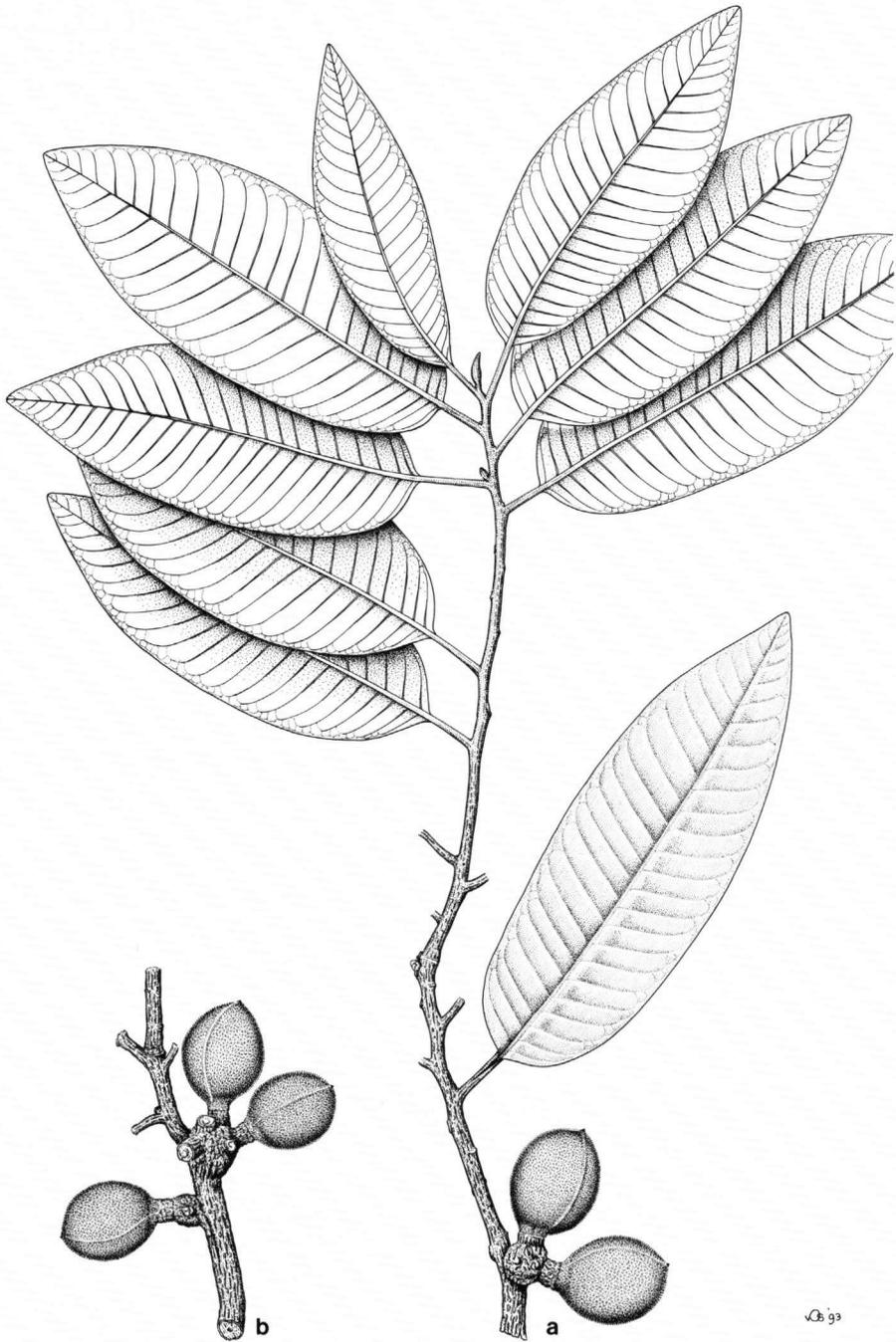


Fig. 18. *Myristica acsmithii* W.J. de Wilde. a, b. Leafy twig with infructescences with mature fruit, both $\times 0.5$ (A. C. Smith 7161, type).

Tree 15–20 m. *Twigs* medium, subterete, towards the apex 2(–3) mm diam., yellow-brown or dark brown, striate, with very minute tomentum, early glabrescent; twigs lower down 4–5 mm thick, with bark coarsely striate, bright dark brown or grey brown pustulate by many concolorous lenticels, sometimes horizontally cracking, but not flaking. *Leaf blades* thinly chartaceous, elliptic or (elliptic-)oblong, 9–14 (–20) by 3–7(–9) cm, broadest usually at the middle, base \pm rounded or shallowly cordate, top subacute with blunt or rounded tip; upper surface drying olivaceous-brown, somewhat paler variegated, glabrous, lower surface greyish or pale brown, glabrous, rather distinctly papillose (lens!), not punctate; midrib above flat or slightly raised; nerves (18–)20–25 pairs, at an angle of 60–80° with the midrib, slender, flat or sunken above; marginal arches present but not conspicuous, tertiary venation faint, sometimes sunken above, rather trabeculate; petiole comparatively slender, drying brown, glabrous, (13–)15–30 by 2–2.5 mm; terminal sterile leaf bud rather slender, acute, 10–15 by 2–2.5 mm, with dense tomentum of bright rusty appressed hairs c. 0.1 mm. *Inflorescences* situated in-between the lower leaves as well as far more lower down on the older wood; of the *Knema*-type, i.e. sessile, simple or shortly 2- (or 3-)forked wart-like woody knobs, up to 5 mm diam., scar-covered, rusty pubescent with hairs 0.1–0.2 mm; male inflorescences with at the top a cluster of 1–5 flowers of various age and size. *Male flowers* densely dark rusty pubescent with hairs c. 0.1 mm; pedicel shortish, \pm curved and flattened, tapering, 3–4 mm long, 0.5–1 mm thick, bracteole persistent, broadly attached at the transition of pedicel and perianth, broadly ovate, c. 3 by 4 mm, 3-dentate, the middle tooth longest, acuminate; perianth membranous, ovoid(-ellipsoid), somewhat curved and angular because of mutual press in the bud stage, 4–4.5 by 3 mm, base rounded, top narrowly rounded, not angular at lobe-sutures; lobes 1.5(–2) mm long, i.e. splitting the perianth for about 1/3; androecium subcylindrical, c. 4 by 0.8 mm; synandrium broadly cylindrical, c. 2–2.3 by 0.8 mm, top blunt, minutely c. 0.1 mm lobulate according to the number of anthers; anthers 3 or 4 (i.e. 7 or 8 thecae, \pm contiguous), androphore 1.5–1.7 by 0.4 mm, glabrous. Female flowers not seen. *Fruits* solitary or up to 4 on woody knobs up to 1 cm diam.; fruit broadly ellipsoid, 2.5–3.5 by 2–2.5 cm, top broadly rounded, base rounded, usually contracted into short pseudo-stalk up to 2 mm long, fruit stalk (fruiting pedicel) stoutish, 2–5 mm long, 5–7 mm thick, coarsely lenticellate and fissured, dry pericarp \pm woody, c. 3 mm thick, tomentum of densely set dark rusty shaggy hairs 0.2–0.5(–1) mm long. *Seed* ellipsoid, c. 2 cm long.

Distribution – Fiji Islands: Viti Levu, Ngau I., Vanua Levu.

Habitat & Ecology – Hill forest, dense forest, dryish forest; 100–500 m altitude. Flowers Nov.–Dec., fruit April–June. Native pigeons swallow seeds whole.

Vernacular names – Kau ndamu (Viti Levu), male (Viti Levu).

Notes – 1. Fieldnotes. Tree, 20 m. Trunk once recorded as slender; fruit on branchlets, below leaves as well as associated with the leaves.

2. This species is closely related to *M. castaneifolia* from which I did split it off. Indeed, as stated by A.C. Smith (Fl. Vit. Nova 2, 1981, 43), the species of the group of *M. castaneifolia*, *M. grandifolia* and *M. macrantha* are closely related but can be separated rather easily. However, *M. castaneifolia* then remains a strongly variable entity, and I am of the opinion that with the description of *M. ascmithii* the

four species, though closely related, are mutually much better in equilibrium. The differences between *M. acsmithii* and *M. castaneifolia* can be found in the key to the species, and are briefly summarized in the next note, but anyway it will be clear that the fruits of the type cannot go with e.g. those of *Smith 5550* and others which belong to *M. castaneifolia*.

3. Although, admittedly, I have seen far less Pacific specimens of the present species than A.C. Smith did for his treatment of the genus in the new Flora of Fiji, and, indeed, some specimens seem difficult to allocate taxonomically, I may summarize the differences with *M. castaneifolia* as follows: In *M. castaneifolia* the habit is generally stouter, with thicker twigs and larger leaves, the bark of the older twigs is often more coarsely striate and deeper fissured; often, between the apical portion of the twigs and the older twig there is a zone with rather smooth surface, only remotely striate because of drying. The inflorescences of *M. castaneifolia* are stouter, the flowers (male flowers seen only) larger, with an entire, not 3-pointed, bracteole, shortly hooded at the top; the fruits are more elongated, slightly longer, with a broadly rounded, nearly truncate base, with short or coarser tomentum; the fruit is often solitary, with very short peduncle, and looks almost sessile. Also *M. castaneifolia* seems to have a larger distributional area and reaches higher altitudes.

4. As a matter of fact, also *M. gillespieana* and *M. chartacea* are closely related to the present species, and possibly a number of 'difficult' collections represent hybrids of yet unknown status.

5. A.C. Smith, Fl. Vit. Nova 2 (1981) 48, fig. 18D depicts a photograph of the fruit of an isotype of the present new species under the name *M. castaneifolia*.

Specimens seen. FIJI. *Degener 14134* (BH); *A. C. Smith 4715, 7161* (T), *7768, 9177*.

14. *Myristica castaneifolia* A. Gray — Fig. 19

Myristica castaneifolia A. Gray, Bot. U. S. Expl. Exp. 1 (1854) 32 ('*castaneaefolia*'); Warb., Monogr. Myrist. (1897) 92, t. 18 f. 1, 2; A.C. Smith, Bull. Torrey Bot. Club 68 (1941) 399, p.p.; Sinclair, Gard. Bull. Sing. 23 (1968) 473, f. 84, p.p.; Parham, Pl. Fiji Isl. (1972) 92; A.C. Smith, Fl. Vit. Nova 2 (1981) 45, f. 18, p.p. — Type (fide A.C. Smith): *U. S. Expl. Exped.* (US 61405, 61406; n.v.).

Tree 5–30 m. *Twigs* medium or stoutish, subterete, towards the apex (2.5–)3–6 mm diam., finely or usually coarsely striate, with minute tomentum with grey hairs less than 0.1 mm, early glabrescent; bark of twigs lower down often coarsely plate-striate, later on grey-brown, rough, often lengthwise fissured and transversely cracked, and with a tendency of flaking, lenticels present but obscure. *Leaves*: blades thinly chartaceous to subcoriaceous, (ob)ovate-oblong to oblong(-lanceolate), broadest at or below or above the middle, (12–)15–26(–32) by 4.5–11(–14) cm, base cuneate, or rounded, or shallowly cordate, top rounded or (gradually) narrowed, usually with blunt tip; upper surface drying olivaceous (sometimes with a coarsely variegated pattern), glabrous, lower surface grey-brown or grey, glabrous (scattered minute hairs present when immature), papillose, not punctate; midrib comparatively broad, up to 4 mm wide at base, above flattish or slightly raised; bright brown contrasting below; nerves 18–25(–30) pairs, at an angle of 50–70° with the midrib, brown, or in specimens with coriaceous leaves yellowish, flat or sunken above; marginal arches pres-



Fig. 19. *Myristica castaneifolia* A. Gray. a. Habit of leafy twig with two single-fruited infructescences; b, c. pieces of flowering twigs with male inflorescences (male flowers respectively not-developed, and immature); all $\times 0.5$ (a: A. C. Smith 8285; b: A. C. Smith 8962; c: A. C. Smith 4946).

ent, sometimes distinct, tertiary venation rather coarse, flat or sunken above, often \pm trabeculate, or coarsely reticulate towards the base of the blade; petiole stoutish, glabrous, drying dark brown or black, (1.5-)2-4.5 by (2-)3-4 mm; terminal sterile leaf bud stoutish, acute or blunt, c. 10 by 3-5 mm, densely grey or rusty pubescent with hairs 0.1-0.3(-0.4) mm. *Inflorescences* pubescent; situated below the leaves, sometimes distichously arranged; of the *Knema*-type, i.e. a sessile (without common peduncle or this up to 2 mm long only), woody, scar-covered brachyblast, simple or forked, in male up to 15 mm long, 3-5 mm thick, with at the end a cluster of 2-5 flowers of various age; pistillate inflorescences smaller; flowers densely grey-brown or rusty pubescent with shaggy hairs (0.1-)0.2-0.5 mm long, bracteole situated at the transition to the perianth, (sub)persistent, comparatively large. *Male flowers*: pedicel short, thickish, somewhat curved, flattish, tapering to beneath, 3-4 by (1-)1.5 mm, bracteole ovate, (sub)persistent, top rounded (not 3-dentate), shortly 'hooded', c. 4.5 by 4 mm; perianth rather hard carnose, ovoid, somewhat angular conforming the bracteole in immature bud-stage, (4-)5-6 by (2.5-)3-3.5 mm (*Smith 4946*), base rounded, top (narrowly) rounded, lobes 2-2.5 mm long, hence splitting the perianth for 1/3 to nearly halfway; androecium cylindrical, c. 5 by 0.8-1 mm; synandrium cylindrical, c. 3 by 0.8-1 mm, top subtruncate, minutely lobulate (c. 0.1 mm or less) corresponding with the anthers; anthers 3 or 4 (or 5) (i.e. c. 8 thecae), contiguous; androphore cylindrical, c. 2 by 0.6 mm, largely minutely pubescent with pale hairs 0.3-0.4 mm, or nearly glabrous. Female flowers not seen. *Fruit* solitary or rarely paired, on woody knob-like infructescence c. 5 mm diam., situated below the lower leaves; fruiting pedicel to 5 mm long; fruit ovoid-oblong, 3.5-4.5 (-5) by 2-3 cm, base broadly rounded or (sub)truncate, top narrowly rounded with apex obliquely shortly beaked, (dry) pericarp 3-5 mm thick, outside with dense rusty or dark brown tomentum with hairs of various length, 0.2-1(-1.5) mm long. *Seed* ellipsoid, 2.5-3 cm long.

Distribution - Fiji Islands: Viti Levu, Vania Levu, Ovalau, Taveuni. A.C. Smith (1981) cited 21 representative specimens.

Habitat & Ecology - Open or dense lower montane or hilly forest 100-1100 m altitude. Flowers and fruit throughout the year.

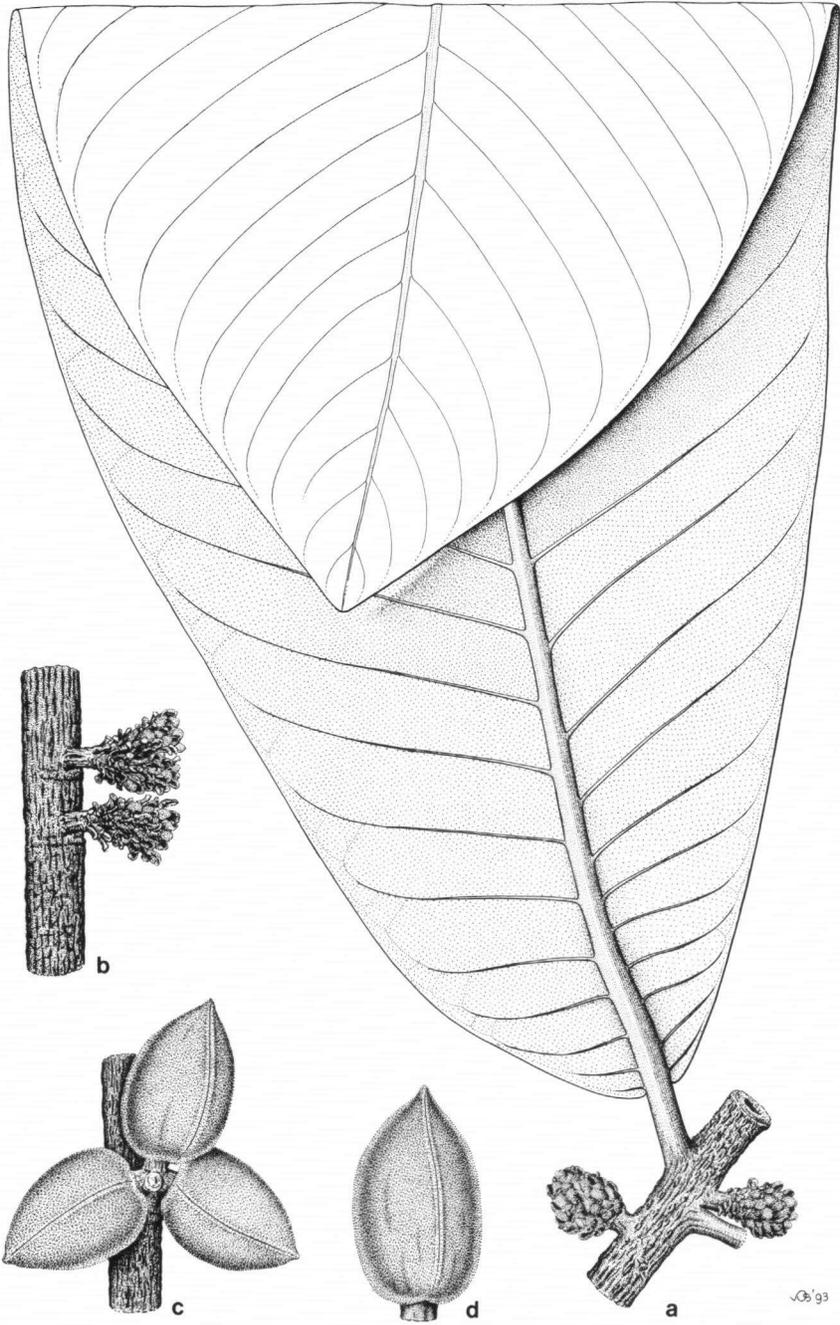
Vernacular names - Male (Viti Levu, Ovalau, Vania Levu), kali, mbaumbulu, nauwanga (Viti Levu).

Uses - Reported as a useful timber tree. Seemann (Fl. Vit., 1867) reported that the nut made a substitute for nutmeg.

Notes - 1. Fieldnotes. Erect tree, to 30 m tall; trunk to 30 cm diam. Branches horizontally spreading. Fruits solitary or clustered below the leaves; aril bright red. Cut stem exuding thin yellowish latex. Perianth pale brown, inside white.

2. I have split off some specimens of a more delicate habit with smaller, more rounded and longer-stalked fruit, and with smaller flowers with 3-dentate bracteole, as *M. acsmithii*; but even then *M. castaneifolia* remains a variable species.

3. Variation. This abounds mainly in the texture of the leaves (these being either membranous or chartaceous, or \pm coriaceous) and the size of the leaves, which may range from c. 15 cm long to over 30 cm. The measure in contrast of the reticulation is variable as well.



Also the mode of hairiness of the fruit may differ much, some specimens having a coarse, long-haired, dark brown tomentum, with hairs 1(–1.5) mm long, e.g. *Smith 5550*, in others the tomentum may be quite short, and more rusty, or paler of colour.

The leaves of *Smith 6383* are only faintly papillose below.

4. Deviating specimens. The following two collections, as present in L, deviate from the remainder of the material: 1) *Degener 15127*: a small-leaved specimen, 'kalimale', from Viti Levu; reminiscent of *M. chartacea*. 2) *Parham 13919* (Fiji, Macuata, Nasolo) deviates by delicate habit; the clustered fruit is immature. 3) *McDaniels 489* (BH, Ithaca), in fruit, shows traits of *M. gillespieana*.

Specimens seen. FIJ. *Degener 14608*; *McDaniels 489* (deviating); A.C. *Smith 4946, 5122, 5550, 6336, 6383, 7141* (mixed?), *7398, 8059, 8285, 8454, 8962*.

15. *Myristica grandifolia* A.DC. — Fig. 20d

Myristica grandifolia A.DC., Prod. 14, 1 (1856) 194; Seem., Fl. Vit. (1867) 205; Drake, Ill. Fl. Ins. Mar. Pac. (1892) 277; A.C. Smith, Bish. Mus. Bull. 141 (1936) 69 (sub *M. macrantha*); Bull. Torrey Bot. Club 68 (1941) 406 (insufficiently known species); Parham, Pl. Fiji Isl. (1964) 60; ed. 2 (1972) 92; A.C. Smith, Fl. Vit. Nova 2 (1981) 43, f. 16. — *Myristica macrophylla* A. Gray, Bot. U. S. Expl. Exped. 1 (1854) 33, non Roxb. (1832), nec Benth. (1853). — Type: U.S. Expl. Exped. (US 58427; n.v.), sterile.

Myristica castaneifolia auct. non A. Gray: Sinclair, Gard. Bull. Sing. 23 (1968) 473, p.p.

Due to lack of material at hand the following description has largely been compiled from the literature: Tree 3–15 m. Twigs stout, (sub)terete, towards the apex c. 1 cm diam., early glabrescent. Leaves robust; blade obovate to obovate-lanceolate, or oblong-elliptic, gradually narrowed to an acute or obtuse base, or sometimes rounded at base; 23–65(–75) by 7–27(–30) cm; lower leaf surface presumably papillose; nerves 18–35 per side, very prominent underneath, at an angle of 50–70° with the midrib; veinlets transverse, scarcely visible on the smooth whitish lower leaf surface; petiole c. 4 cm long; sterile terminal leaf bud ovoid-oblong, subacute, c. 2 cm long, minutely appressed pubescent. Inflorescences of the *Knema*-type, simple or forked, stout, borne on the branchlets below the leaves, in male up to 8 cm long, resembling those of *M. macrantha*. Flowers copiously brown-sericeous outside (hairs 1–2 mm), greenish white, glabrous within. Male flowers: pedicel c. 5 mm long, 2–3 mm diam.; bracteole ovate, 5–6 mm long, inserted at apex of pedicel, (sub)persistent; perianth in bud (ellipsoid-)oblong, c. 10 mm long, 3.5–4 mm wide, lobes 2.5–3 mm long, reflexed at anthesis; androecium cylindrical, c. 9 mm long; synandrium cylindrical, c. 5 mm long, androphore cylindrical, 3–4 mm long, pilose in its central portion; anthers contiguous, possibly c. 6; sterile apex ± absent, blunt. Female flowers not

Fig. 20. *Myristica macrantha* A.C. Smith. a. Habit of portion of leafy twig with immature male inflorescences; b. flowering male inflorescences, several growing seasons old; c. infructescence with mature fruits; all × 0.5. — *M. grandifolia* A.DC. d. Mature fruit, × 0.5 (a, b: A.C. Smith 7141 (L; in L identified by Smith as *M. macrantha*, the same collection number according to Smith, Flora Vitiensis Nova 2, 1981: 43, and fig. 16 belonging to *M. grandifolia*; c: redrawn from photograph, Smith, l.c.: fig. 17, after Howard 208; d: redrawn from photograph, l.c.: fig. 16, after DA 16921).

seen. *Fruit* ellipsoid-oblong, base broadly rounded, top rounded, 5–6(–8) by 3–3.5(–5.5) cm, minutely pubescent. *Seed* ellipsoid-oblong, 4.5–5 cm long. Fruiting pedicel (or stalk or inflorescence?) 5–10 mm long, 8–12 mm diam.

Distribution – Fiji Islands: Viti Levu, Ovalau, Vanua Levu, Taveuni. A.C. Smith (1981) quoted 10 collections studied.

Habitat & Ecology – Dense forest or secondary forest; 100–800 m altitude. Flower and fruit April–May.

Vernacular names – Kau ndamu, male.

Notes – 1. Fieldnotes. Tree 3–15 m high. Perianth greenish white within; anthers yellow. Indument of fruit brown, aril red.

2. Typification and nomenclature. The holotype of *M. macrophylla* A. Gray (for which *M. grandifolia* is a substitute name) is *U.S. Expl. Exped. (US 58427)*, collected in 1840 on Ovalau. The specimen is sterile, but subsequent collections permitted an understanding of the taxon (cf. Smith, l.c.).

3. The status of *M. grandifolia*, especially as opposed to *M. macrantha*, remains rather unclear, and due to lack of material at hand I largely have relied on A.C. Smith, who commented on the species respectively in 1936, 1941, and 1981.

4. In L there are two collections of *M. macrantha*, both identified by A.C. Smith: *Smith 7141 & 7363*. These two specimens look very similar vegetatively, especially in the large leaves. However, *Smith 7141*, with male flowers, is treated by Smith (1981) under *M. grandifolia*, and the male flowers are photographed and illustrated for the latter species. Possibly *Smith 7141* in L is a mixture.

16. *Myristica macrantha* A.C. Smith — Fig. 20a–c

Myristica macrantha A.C. Smith, Bish. Mus. Bull. 141 (1936) 67, f. 33; Bull. Torrey Bot. Club. 68 (1941) 399; *ibid.* 70 (1943) 540; Parham, Pl. Fiji Isl. (1964) 60; ed. 2 (1972) 92; A.C. Smith, Fl. Vit. Nova 2 (1981) 43, f. 17. — Type: A.C. Smith 1719 (NY, n.v.; iso K; A, BO, UC, US, n.v.).

Myristica castaneifolia auct. non A. Gray: Sinclair, Gard. Bull. Sing. 23 (1968) 473, p.p., incl f. 84 F–I.

Due to scarcity of material seen, the following description is largely compiled from the cited literature: Tree 5–20 m. *Twigs* stout, terete, towards apex c. 10(–15) mm diam., with minute tomentum, dark grey brown, coarsely striate, early glabrescent; bark of twigs lower down coarsely striate, longitudinally fissured and/or transversely cracked; lenticels present, large but not contrasting. *Leaves* thickly chartaceous or (sub)coriaceous; blades large, oblong, (23–)35–65(–75) by (7–)12–27(–30) cm, base somewhat narrowed, rounded or (sub)cordate, top obtuse or acutish with blunt tip, upper surface drying olivaceous-brown, lower surface grey-brown or pale brown, with sparse minute pubescence, early glabrescent, distinctly papillose (lens!); not punctate; midrib stout, flat or slightly raised above; nerves (18–)24–35 per side, at an angle of 60–80° with the midrib, light brown contrasting below, tertiary venation ± trabeculate, plane (flat), faint or hardly visible on both surfaces; petiole stout, coarsely striate, dark brown, glabrous, (20–)40–60 by 5–8 mm; terminal sterile leaf bud not seen. *Inflorescences* stout, almost of the *Knema*-type (Smith mentioned 'coarsely vermiform'), i.e. without or with a short common peduncle to 5(–8) mm

long, 5–7 mm thick, glabrescent, proceeding into a simple or 2- or 3-forked brachyblast up to 6 cm long, 1 cm wide, brown pubescent or villose with hairs 0.5–1(–1.5) mm long, the arms densely covered with coarse scars of bracts and pedicels, the latter in staminate specimens often remaining attached after the perianth has fallen at anthesis; female inflorescences shorter than male; flowers crowded at the ends of the brachyblasts, of varying age and size; inflorescences situated in the axils of the lower leaves, or associated with leaf-scars below the leaves on the older wood, sometimes ± crowded in distichous rows below the leaves. *Flowers* densely silky-brown pubescent with hairs c. 1 mm long, bracteole persistent or late caducous, situated at the top of the pedicel. *Male flowers* (mainly according to Smith, 1936, 1981): pedicel stout, 3–5 mm long, 1.5–2.5 mm diam.; bracteole ± ovate, c. 5 mm long, perianth thick-carnose, ± ovoid-oblong (campanulate), c. 10 mm long, c. 5 mm broad, lobes 2–3 mm long and broad; androecium 6–8 mm long; synandrium 5–7 mm long, anthers c. 6 (i.e. c. 12 thecae), androphore 1–2 mm long, glabrous; sterile apex minute, obtuse. Female flowers not seen (only seen in the immature state by Smith: ovary subglobose, densely pilose). *Fruit* solitary or up to 4 together, subsessile; ovoid or globose-ovoid, 3–4 by 2.5–3 cm, top apiculate; pericarp densely brown-tomentose. Seed not known. Fruiting pedicel to 4 mm long and 9 mm diam.; mature fruit seldom exceeding 4 by 3 cm.

Distribution – Fiji Islands: Viti Levu, Vanua Levu, Ovalau. Smith (1981) cited 16 collections.

Habitat & Ecology – Dense hill forests; 10–700 m altitude. Flowers and fruit May. Not uncommon locally.

Vernacular names – Male wanga, male ni Waqua, kau ndamu.

Uses – Wood not durable, but used for timber.

Notes – 1. Fieldnotes. Leaves shining green above, glaucous below. Male perianth glabrous, greenish within; the lobes reflexed at anthesis.

2. *Myristica macrantha* is largest among the Pacific species of the genus in regard to size of branchlets, leaves, flowers, etc., which readily distinguishes it from its allies in Fiji (fide Smith, 1936). Much related to *M. grandifolia* (see there), and resembling stout specimens of the also related *M. castaneifolia* which is different by its smaller staminate inflorescences and smaller staminate flowers.

Specimen seen. FIJI. A. C. Smith 7363.

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Numbers refer to the species number as used in this article. New names and new combinations have been printed in bold type, other accepted names in roman type, synonyms and not accepted names in *italics*.

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castaneifolia A. Gray 14

castaneifolia auct. 15, 16

cerifera A.C. Smith 6

chalmersii Warb. 2a

chartacea Gillespie 12

faroensis Hemsl. 3

fatua Houtt.

var. *inutilis* (Rich. ex A. Gray) Sinclair 1a

var. *platyphylla* (A.C. Smith) Sinclair

1b (1b-1)

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 2a
 subsp. *muelleri* (Warb.) W.J. de Wilde
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grandifolia A.DC. 15
guadalcanalensis W.J. de Wilde 4
guadalcanalensis Sinclair 4
guillauminiana A.C. Smith 10
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hypargyrea A. Gray 9
 subsp. *hypargyrea* 9a
 subsp. *insularis* (Kaneh.) W.J. de Wilde
 9b
 var. *gillespieana* (A.C. Smith) Sinclair
 11
 var. *guillauminiana* (A.C. Smith)
 Sinclair 10
 var. *insularis* (Kanehira) Sinclair 9b
hypargyrea auct. 9b
insularis Kanehira 9b
inutilis Rich. ex A. Gray 1
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 f. *nanophylla* W.J. de Wilde 1b3
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