New *Tristaniopsis* Peter G.Wilson & J.T.Waterh. (Myrtaceae) From Borneo

P. S. ASHTON

Arnold Arboretum, Harvard University, 22 Divinity Avenue
Cambridge MA 02138, U.S.A.

and

Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB, U.K.

Abstract

Three new species, *Tristaniopsis kinabaluensis* P.S.Ashton, *T. microcarpa* P.S.Ashton and *T. rubiginosa* S.Teo *ex* P.S.Ashton, and three new subspecies, *Tristaniopsis kinabaluensis* ssp. *silamensis* P.S.Ashton, *T. merguensis* ssp. *tavaiensis* P.S.Ashton and *T. whitiana* ssp. *monostemon* P.S.Aston, are described from northern Borneo, in preparation for a treatment of the Myrtaceae for the *Tree Flora of Sabah and Sarawak.*

Introduction

Species definition in *Tristaniopsis* Peter G.Wilson & J.T.Waterh. (formerly *Tristania* R. Br.) has proven to be even more difficult in Borneo than among the notorious and much larger myrtaceous genus *Syzygium* Gaertn. Leaf size and shape is variable. The number of stamens, which are clustered opposite the petals, is characteristic of each species but, although at most 10 per cluster, may vary in exceptional cases. Here, we adopt a conservative species concept, awaiting regional monographic and phylogenetic research. Eventually, and with further flowering collections, some at least of the infrapecific taxa described here may be raised to species rank.

All specimens examined have been at the Kew herbarium unless otherwise stated.

1. **Tristaniopsis kinabaluensis** P.S.Ashton, ***sp. nov.***

T. merguensis affinis, foliis minoribus basim versus subsessilibus attenuatis vel anguste obtusis haud auriculatis, subtus hebete glaucescentibus, staminibus 3(-5) in fasciculis, fructibus ad 5 x 4 mm minoribus facile

distinguitur. **Typus:** *A. Gibot SAN 60705*, Sabah, Bukit Hampuan, Ranau, in flower (holo K; iso SAN).

Tree to 20(-35) m tall, to 30 cm diameter. Bark rust-brown, cracked and falling in small flakes; inner bark red-brown. Young parts densely yellowish silvery to pale brown downy, caducous. Twig *c.* 3 mm diameter, stout, eventually dark brown. Leaf subsessile, thickly leathery, dull, drying mauve to dark yellowish brown, generally pale mauve glaucous beneath, pits more or less apparent above, dots faint to obscure beneath; blade obovate-oblanceolate, 4–12 x 1.5–4.5 cm, base tapering or abruptly terminating at the *c.* 1 mm stout stalk, apex rounded or shortly broadly acuminate; venation hardly or not raised on either surface, main lateral veins *c.* 15 pairs, ascending. Cyme to 8 cm long, terminal or axillary, doubly branched, the branches and flowers clustered towards the end of the rachis. Flower bud to 4 x 3 mm, obconical, subsessile; sepal lobes to 1 x 1 mm, ovate acute; stamens 3(-5) per cluster. Capsule to 4 x 3 mm, ellipsoid or spherical.

Notes: As *Tristaniopsis merguensis* but leaf smaller, subsessile, base tapering or narrowly obtuse not auriculate even in juveniles, dull more or less mauve glaucous beneath; stamens 3(-5) per fascicle; capsule to 5 x 4 mm, smaller. The floral stamens are 3 in a fascicle as in *T. whitiana* (Griff.) Peter G.Wilson & J.T.Waterh. but the leaf is smaller, thickly leathery, and subsessile.

Subspecies ***kinabaluensis***

Subspecies tomento rufescente-brunneo, costis foliorum obscuris, fructu ad 5 x 4 mm lobis sepalorum ad 1 x 1 mm capsula amplexa valvis ad 4 x 2 mm ellipticis distinguitur.

Hairs dull rufous-brown; leaf venation obscure throughout; fruit to 5 x 4 mm, sepal lobes to 1 x 1 mm clasping base of to 4 x 2 mm elliptic capsule valves following dehiscence.

Distribution and ecology: Known only in and near Kinabalu National Park. Locally common in lower montane oak-laurel forest.

Other specimens examined: SABAH - *Mikil SAN 33924* (K), *Mikil SAN 33945* (K), *Madani SAN 36776* (K, SAN), road to Kamburangoh, Ranau; *Meijer SAN 37990* (K, SAN), above Tenompok; *Clemens 30242* (K), Tenompok; *Chew & Corner RSNB 4859* (K, SING); *RSNB 4148* (K, SAN, SING) Mesilau R.; *Chew & Corner RSNB 4458* (K, SAN, SING)

Bambangan R.; *Chew et al. 1862* (K, SAN, SING), *Beaman 10699* (K), Pinosuk Plateau; *Beaman 9381* (K), above bank of E. Mesilau R.

Notes: Several collections from Sarawak, in fruit or young bud, differ in their less coriaceous, dull but not glaucous leaf blade. These include *Chai S 30427* (K, SAN, SING), *Anderson S 4289* (K, SAN, SING), *Abg. Mochtar et al. S 30818* (K, SAN), Gunung Api, Mulu N.P.; *B. Lee S 38259* (K, SAN), Bukit Berar, Mulu N.P.; *Abg. Mochtar et al. S 49609* (K, SAN), Mulu N.P.; *Yii, P.C. S 41131* (K, SAN), Sabal F.R., Serian. They were collected from organic soils on limestone to 100 m altitude, and on sandstone. Good flowering material is needed to decide their identity.

Subspecies ***silamensis*** P.S.Ashton, ***ssp. nov.***

Subspecies tomento argento-luteo, costis foliorum patentibus costis lateralibus subtus elevatis, calyce in fructu tenue lobis ad 3 x 4 mm rotates, capsula ad 4 mm diam. globosa valvis ad 4 x 3 mm latioribus differt. **Typus:** *G. Shea SAN 75187*, Sabah, Gunung Silam, Lahad Datu, 800 m, in flower (holo K; iso SAN, SING).

Hairs yellowish silvery; leaf venation visible, the main lateral veins slender slightly raised beneath; fruit calyx to 8 mm diameter, shallowly cup-shaped, the lobes spreading, to 3 x 4 mm; capsule to 4 mm diameter, spherical, valves broadly elliptic, to 4 x 3 mm.

Distribution and ecology: Known only from Mt. Silam, coastal E. Sabah; on ultramafic substrate at 800-900 m in lower montane *kerangas.*

Other specimens examined: *Shea SAN 75180* (K), *Mujin SAN 37845* (K, SAN, SING), *Beaman 6991* (K), Mt. Silam.

2. **Tristaniopsis merguensis** (Griff.) Peter G.Wilson & J.T.Waterh.

Austr. J. Bot. 30 (1982) 430. **Basionym:** *Tristania merguensis* Griff., Pl. Cantor.(1857) 18. **Holotype:** *Griffith s.n.*, Mergui, peninsular Burma (holo K).

Synonyms:
Tristania maingayi Duthie, Fl. Brit. Ind. 2 (1878) 467; *T. subauriculata* King, J. As. Soc. Beng. 70, 2 (1901) 502.
New synonyms:
T. stellata Ridl., J. Bot. (1930) 38. **Type:** *Haviland 1983*, Sarawak, Kuching

(holo K); *T. grandifolia* Ridl., *loc.cit.*, *Tristaniopsis grandifolia* (Ridl.) Peter G.Wilson & J.T.Waterh., *loc. cit.* **Type:** *Beccari 2489*, loc. incert. (holo K).

Subspecies ***merguensis***

Canopy tree to 30 m high, to 40 cm diameter. Bark red-brown, becoming irregularly cracked and coarsely flaky in scroll-like pieces, fibrous; inner bark pale red brown, rather crumbly. Sapwood rich red-brown, hard. Inflorescence rachis persistently minutely yellow-brown pubescent, flower buds caducously so, parts otherwise hairless. Twigs 3–5 mm diam., round, glabrous, smooth soon thinly flaking. Leaf blade elliptic to obovate, (6–)10(–17) x (2–)4(–7) cm, leathery, glabrous; apex sharply to broadly acute, base without distinct stalk, distinctly auriculate in juvenile leaves but less distinctly so in mature leaves; main lateral veins shallowly furrowed to slightly raised above, raised below, (17–)28(–34) pairs, 2–8 mm apart, ascending; intramarginal vein *c.* 1 mm within margin. Cyme to 12 cm long, to 5-branched. Flower bud *c.* 3 x 2 mm; pedicel to 2.5 mm long; calyx lobes *c.* 1 x 1 mm; petals *c.* 1.5 mm long; stamens (3–)5–10 per cluster, filament 1–2 mm long; anther *c.* 0.1 mm. Capsule to 1 x 0.8 cm, ellipsoid-globose, pedicel 0.5–1 mm long; seeds *c.* 0.8 x 0.3 cm, relatively large, elliptic.

Distribution and ecology: East coast of Peninsular Malaysia (including Singapore) and throughout Borneo. In lowland mixed peat swamp forest over sandy alluvium, *kerangas* forest over ultramafic rock and rarely on limestone hill and organic soil on high ridge tops to 1000 m.

Specimens examined from Borneo: SABAH – *Ahmad Talip SAN 68396* (K, SAN, SING), Silam, Lahad Datu; *Joseph B. & Kuntul SAN 12085* (K), Mt Silam; *A. Gibot SAN 66926* (K, SAN), Lumut, Beaufort; *Saikeh SAN 73354* (K, SAN), Mesapol, Sipitang. SARAWAK – *Bujang Tajai S 1997* (K), *Smythies S 808* (K), Kayangeran F.R., Lawas; *Haviland & Hose 3187* (K), 'Baram'; *Anderson S 30830* (K, SING), Gunung Api, Mulu N.P.; *Brunig S 0970* (K), Merurong Plateau, Bintulu; *Othman & Abak S 8854* (K, SAN, SING), Bukit Urang, Bintulu; *Brain S 15947* (K, SING), Nyabau F.R., Bintulu; *A. Muas S 13356* (K, SAN), Balai Ringin P.F., Serian; *Hj. Bujang S. 13440* (K, SAN, SING), Gunung Selang, Kuching; *Yii, P.C. S 42956* (K, SAN), Telok Gador, Bako N.P., Kuching; *Haviland 1983* (K), near Kuching; *Beccari 3676* (K), *2489* (K), *loc. incert.* BRUNEI – *Ashton S 5898* (K, SING), Seria; *Ashton BRUN 808* (K), *Ashton 819* (K), Labu, Temburong. E. KALIMANTAN – *Kostermans 13137* (K, SING), Mt. Palimasan, W. Kutei.

Notes: We agree with the synonymy recommended by Kochummen (1978), but doubt whether *Tristaniopsis pontianensis* M.R. Henders. of southern Johor is distinct either. We here formally reduce *T. grandifolia* Ridl., in fruit, whose large leaves are typical of immature trees and *T. stellata* Ridl. in which the leaves are at the small end of the observed range.

Subspecies ***tavaiensis*** P.S.Ashton, ***ssp. nov.***

A species typico foliis ad 11 x 4 cm minoribus distincte petiolatis ad 5 mm late acuminates, cymis ad 8 cm longis brevioribus. **Typus:** *L. Madani SAN 81723*, Tavai Forest Reserve, Telupid, Sabah (holo K; iso KEP, SAN, SING).

Differing from the type subspecies as follows:
Leaf blade to 11 x 4 cm, smaller, with distinct 8–10 mm long stalk, to 5 mm long broadly acuminate apex; cyme to 8 cm long, shorter.

Distribution and ecology: Known only from Bukit Tavai F.R., S. Meliau, Karamuak, Telupid in forest overlying ultramafic rock.

Other specimens examined: SABAH – *Soepadmo et al. FRI 41309* (K, SING), *Zainudin 5029* (K, SAN), *Cheksum Tawan CST 285*, *Perumal & Sundaling SAN 135176* (K, SAN), all from the same locality of the type.

3. **Tristaniopsis microcarpa** P.S.Ashton, ***sp. nov.***

T. merguensis similis foliis maioribus haud auriculatis, floribus minoribus staminibus paucis fructibus minimis differt. **Typus:** H. S. Martyn *SAN 21623*, Look Mengulang, P. Sakar, in flower (holo K; iso KEP, SAN, SAR, SING).

Canopy tree to 30 m tall, to 80 cm diameter. Bark at first smooth greenish to yellow- or rust-brown, later exfoliating in large grey-brown scroll-like strips, eventually becoming shaggy towards base. Living parts shortly greyish puberulent, more or less persistent on cyme and exposed parts of flower and fruit, elsewhere early glabrescent. Twig *c.* 5 mm diam., round, stout, drying blackish at endings, becoming grey brown thinly peeling. Leaf blade (9–)13–27 x (3–)5–10 cm, oblanceolate, thinly leathery, minutely densely and larger sparsely dotted beneath, pitted above, drying dull olive-brown darker above; subsessile or occasionally tapering into *c.* 15 mm long stalk; apex shortly broadly acuminate or blunt; main lateral veins 25–30 pairs with variably distinct intermediates, dense, spreading, raised throughout more so beneath; tertiary veins lax distinct. Cyme to 15 cm long, to 3 mm

diam. at base, elliptic in section, slender, to 4-branched, with to 8 cm long erect rachis. Flower to 3 x 3 mm, small; stamens 3(–4) in each cluster. Capsule to 6 x 4 mm, to 6 mm wide when open, 3-celled; seeds many, small.

Distribution and ecology: Known from Sabah where it is widespread, NE Sarawak to the Rejang valley, and E and C. Kalimantan to the Schwaner Range. Locally frequent in mixed dipterocarp forest to 1000 m, on clay and sandy clay soils over both sedimentary, and also ultramafic rocks where it is sometimes common.

Other specimens examined: SABAH – *Sigin & Rahim SAN 99694* (K, SAN, SING), Bukit Mensasau Beluran; *Madani SAN 130694* (K, SAN), Bidu-Bidu F.R., Beluran; *Amin G. et al. SAN 93896* (K, SAN, SING), Kiabau, Beluran; *Amin G. SAN 70315* (K, SAN), Telupid; *Davol, Pius et al. SAN 124652* (K, SAN), S. Kim, Tankulap, Telupid; *P.S. Shim SAN 134716* (K, SAN, SING), Bukit Tingka, Telupid; *Leopold & Taha SAN 83534* (K, SING), *Kodoh & Tarmijin SAN 83666* (K, SAN, SING), M.87 Telupid Rd., Sandakan; *Meijer SAN 53317* (K, SAN, SING), Sungai Meliau, Karamuak, Sandakan; *Madani SAN 81176* (K, SING), Bintang Mas logging area, Karamuak; *A. Gibot SAN 36069* (K, SAN), *Singh & Talip SAN 52602* (K, SAN, SING), *A. Gibot SAN 36025* (K, SAN), Pulau Sakar; *Muin Chai SAN 26995* (K, SAN, SING), *Muin Chai SAN 26655* (K, SAN, SING), *H.S. Martyn SAN 21613* (K), Look Mengulang, P. Sakar; *Joseph B. et al. SAN 120799* (K, SAN), Km 24 Taliwas, Lahad Datu. SARAWAK – *S. Tong S 32801* (K, SAN), Ulu Masia, Meligan range, Lawas; *Yahud et al. S 76338* (K, SAN), Sungai Kelepang, Remudu, Bario; *P.J. Martin S 38913* (K, SAN), Gunung Mulu N.P.; *Othman et al. S 41468* (K, SAN), Ulu Balleh; *Othman et al. S 62110* (K, SAN), Nanga Sebatu, Mengiong, Balleh, Kapit. C. and W. KALIMANTAN – *Argent & Wilkie 943* (K, SAN), Km 48 from Sangai, Sungai Mentoya, Kota Waringin Timor; *Jarvis & Ruskandi 6212* (K), Bukit Raka, Bukit Raya N. P.

Notes: This species is similar in leaf to *Tristaniopsis merguensis,* but the leaf is larger, never auriculate at base even in juveniles; the flowers are smaller with fewer stamens, and the fruit is much smaller.

4. **Tristaniopsis rubiginosa** S.Teo *ex* P.S.Ashton, ***sp. nov.***

Species praestans foliis magnis subtus prominenti fusco-brunneo puberulentibus staminibus 3–4 in fasculo facile distinguitur. **Typus:** *Purseglove 5053*, fruit, Telok Asam Bako N.P. (holo K; iso SAR, SING).

Small tree to 7 m tall, to 15 cm diam., with open prominently chocolate-brown-leaved crown. Bark pale grey and mauve peeling and scroll-marked; inner bark whitish. Sapwood dark tallow-brown. Young parts densely dark warm brown pubescent, caducous successively on leaf blade above, blade beneath, leaf stalk, twig, cyme and floral receptacle, more or less persisting into fruit. Twig *c.* 5 x 4 mm apically, somewhat flattened at first becoming round, smooth, blackish when dry, eventually thinly flaking. Leaf blade 10–17(–28) x 5–9 cm, broadly elliptic to obovate, thickly leathery, more or less persistently dark chocolate-brown pubescent beneath fading to mauve in fallen leaves, drying dull mauve-brown above, densely pitted above, dots obscure beneath; margin inrolled; base wedge-shaped narrowly tapering down sides of 10–17 mm long stout stalk; apex to 1 cm long broadly acuminate or blunt rounded; main veins *c.* 26 pairs with unequally dispersed more or less equal intermediate veins, spreading, slender but distinctly raised beneath, visible but hardly raised above; tertiary veins obscure, lax. Cyme to 12 cm long, terminal or subterminal-axillary, to 3-branched, drying flattened and ribbed. Flower bud to 5 x 3 mm, relatively large, ellipsoid, receptacle obconical; stamens 3–4 per cluster. Capsule to 5 x 4 mm, to 7 mm diam. following dehiscence; seeds many, small.

Distribution and ecology: Endemic to northern Borneo. Very local, but at Bako National Park abundant, on podsols in *kerangas* on sandstone plateaux and raised beaches, and in the open '*padang*' vegetation on the tableland, and on ultramafic substrate in Sabah, at low altitude.

Other specimens examined: SARAWAK – *Sipun Dominic & Dami S 81530* (K, SAN), *Chai & Ilias S 17868* (K, SAN, SING), *Corner & Brunig* S *10495* (K), *Brunig S 10408* (K), *Anderson & Ashton S 12341* (K, SING), *Sinclair & Kadim SFN 10315,* Bako N.P., Kuching. SABAH – *Saw L.G. FRI 36238* (K, SAN), Meliau Basin. BRUNEI – *Ashton BRUN 647* (K, SING), Bukit Puan.

5. **Tristaniopsis whitiana** Peter G.Wilson & J.T.Waterh.

Austr. J. Bot. 30 (1982) 440. **Basionym:** *Tristania whitiana* Griff., Pl. Cantor. (1837) 18. **Type:** *White s.n.,* Singapore (CAL?, not seen). **Synonym:** *Tristania sumatrana* Miq., Fl. Ind. Bat., Suppl. (1861) 308.

Subspecies ***whitiana***

Canopy, occasionally shortly emergent tree to 45 m high, to 1.5 m diam.,

with concave rounded buttresses. Bark at first white to light greenish grey with occasional hint of very pale orange, smooth, later peeling in scroll-like strips; older unpeeled bark evenly pale grey-dull light olive; peeled bark scrolls pale to dark grey with mauve-brown patches; inner bark whitish. Sapwood yellowish. Leaf beneath, rachis, flower bud, fruit sparsely or densely more or less persistently grey-brown puberulent, or sometimes glabrous. Twigs *c.* 2 mm thick apically, slender, round, glabrous, smooth eventually thinly peeling. Leaves shiny fresh green when alive, drying rich dark olive-brown glistening beneath, oblong to lanceolate, (7.3–)12.9(–26) x (2.5–)4(–5.5) cm, thinly leathery; base narrowly wedge-shaped, stalk distinct, (0.5–)0.8(–1.2) cm long, slender; apex sharply acute; main lateral veins subequal, (54–)68(–92) pairs, very many, dense, slender, slightly but distinctly raised above and below; intramarginal vein to 1 mm within margin. Cyme to 10 cm long, to 5-branched, with long slender rachis. Flower cream with yellow stamens; bud *c.* 1.5 x 1 mm; pedicel *c.* 1 mm long; calyx minutely warty, unribbed, lobes *c.* 0.5 x 1 mm; petals *c.* 1.5 mm long; stamens 3 per cluster opposite each petal, filament *c.* 1.5 mm long, anther *c.* 0.2 mm. Capsule *c.* 4 x 3.5 mm, ellipsoid; seeds many, *c.* 0.4 x 0.2 mm, elliptic.

Distribution and ecology: Sumatra, Peninsular Malaysia (including Singapore) and Borneo. More abundant in Sarawak and SW Sabah than elsewhere in Sabah. The paradigmatic late successional tree of landslips on the steep inland hills. Locally abundant also in secondary forest and river banks from the lowland to upper dipterocarp forest, to 1500 m on Mt. Kinabalu; generally in dipterocarp forests on mostly clay soils, but on sandy soils and the transition to *kerangas* in W. Sarawak.

Other Borneo specimens examined: SABAH – *Lowe s.n.* (K) 'Borneo'; *Woods 31* (K), *loc. incert.*; *Orolfo SAN 5488* (K, SING), Ulu Tawau; *Orolfo SAN 23* (K, SING), Silimpopon R., Sta. Lucia (= Tawau) For. Dist.; *Meijer SAN 19526* (K, SING), Serudong, Tawau; *Leopold & Taha SAN 83584* (K, SAN), M 87½ Telupid road, Sandakan; *Brand SAN 30876* (K, SAN, SING), Berambangan, Kudat; *A. Gibot SAN 79604* (K, SAN, SING), Kinabalu N.P.; *Saikeh SAN 72244* (K, SAN, SING), Beaufort; *Dewol & Karim SAN 77725* (K, SAN, SING), Lumaku F.R., Sipitang. SARAWAK – *Beccari 2773* (K), *2916* (K), *loc. incert., Chai S 39731* (K, SAN), Sungai Mentawei Mulu N.P.; *Anderson S 4219* (K, SAN, SING), Melinau Paku path Gunung Mulu; *S. Tong S 34929* (K, SAN), Sungai Koyan Mengak, Belaga; *Richards 2459* (K), Long Kapa, Dulit, Tinjar; *Jacobs 5399* (K), Belaga, *Daud & Tachun SFN 35672* (K, SING), Nanga Pelagus, Kapit; *Ilias S 25783* (K, SING), Bukit Pantu, Kapit; *Othman Ismawi* S *40049* (K), Semengoh arboretum, Kuching; *Dg. Awa & Othman Ismawi S 47100* (K, SAN), Teluk

Bandung, Santubong; *Sinclair & Kadim SFN 10394* (K, SING), Sempadi F.R., Lundu. BRUNEI - *Ashton & Whitmore BRUN 485* (K, SING), Bangar; *Ashton BRUN 881* (K), Ulu Tutong at first rapid.

Subspecies ***monostemon*** P.S.Ashton, ***ssp. nov.***

A species typico floribus staminibus solo 5 differt. **Typus:** *Dan S 3033,* Lambir Hills, Sarawak (holo K; iso SAN, SING).

Differing from the type subspecies as follows: Tree at most 25 m tall, 30 cm diam.; bark brilliant coppery-brown; flower with a ring of 5 single stamens.

Distribution and ecology: Known from throughout Sarawak, Brunei, and W. and C. Kalimantan. Locally gregarious; on banks, usually on sandstone rocks, by white and black water rivers, in *kerangas* forest.

Other collections examined: SARAWAK – *B. Lee S 46502* (K, SAN); *Ilias S 15452* (K, SAN, SING), Sungai Sebiau, Bintulu; *Ashton S 16457* (K, SAN, SING), Sungai Jilai, Tatau; *Jugah S 15224* (K, SAN, SING), Sungai Sabal Tapang, Serian; *S. Teo S 75432* (K, SAN), Matang Wildlife Centre; *Jugah S 51588* (K, SAN), Sungai Raya, Division I; *Enjah et al. S 75426* (K, SAN), Pueh F.R. BRUNEI – *Niga et al. BRUN 15109* (K, SAN, SING), Sungai Lumut, Belait; *Coode 7102* (K, SAN, SING), Ulu Tutong; *Ashton BRUN 3303* (K, SING), Bukit Patoi. KALIMANTAN – *Awmack 19* (K), W. bank of R. Rekut, C. Kalimantan; *Church et al. 1745* (K, SAN), 8 m north of Desa Jelundung, Serawai, W. Kalimantan.

Notes: The single stamen opposite each petal is diagnostic. The tree is conspicuously different from the type on account of its vivid bark colour, but more collections in flower are needed to confirm whether bark and stamen characteristics are always correlated.

Acknowledgements

Stephen Teo, formerly of the Sarawak Forest Department Herbarium, early recognized many of the taxa, and prepared draft descriptions upon which the present descriptions are partially based. The work is otherwise based on collections at the Royal Botanic Gardens, Kew and Harvard University herbaria. Eve Lucas at Kew and Emily Wood at Harvard have been generous with their counsel. Staff at KEP, SAN, SAR and SING provided information on specimens in their care.

Reference

Kochummen, K.M. 1978. *Tristania*. *Tree Flora of Malaya*. **3**: 251-253.