Gardens' Bulletin Singapore 67(1): 69–84. 2015
doi: 10.3850/S2382581215000083

Novitates Bruneienses, 3. Eight new woody plants in the Brunei flora, including five new species

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ABSTRACT. Five new species of seed plants are described: *Alangium kayuniga* K.M.Wong (Cornaceae), *Melastoma ariffinii* K.M.Wong, *Melastoma ashtonii* K.M.Wong, *Melastoma joffrei* K.M.Wong & Y.W.Low (Melastomataceae), and *Lasianthus jangarunii* Y.W.Low (Rubiaceae). New plant records for the ongoing Brunei floristic inventory include *Planchonea valida* (Blume) Blume (Lecythidaceae), *Melastoma velutinosum* Ridl. (Melastomataceae), and *Gardenia costulata* Ridl. (Rubiaceae).

Keywords. Borneo, Cornaceae, Lecythidaceae, Malesia, Melastomataceae, new records, new species, Rubiaceae, Southeast Asia

Introduction

In this third installment of the series *Novitates Bruneienses*, we report our findings of new species in four plant families. These include a new *Alangium* species (Cornaceae), three new species and a new record in *Melastoma* (Melastomataceae), a new *Lasianthus* species and a new *Gardenia* record (Rubiaceae), and a new record of *Planchonea* (Lecythidaceae). Herbarium acronyms used follow Thiers (continuously updated). All conservation assessments follow the methodology of IUCN (2012). For the new species the assessments are global, for the new records we provide national assessments for Brunei. All specimens cited have been seen by the authors.

Five new species

CORNACEAE

Alangium kayuniga K.M.Wong, **sp. nov.**
This new species is distinctive among the tree species of *Alangium* with a pinnately veined leaf base, differing from *A. havilandii* Bloemb. in its subtruncate calyx tube (the calyx tube in *A. havilandii* has distinct triangular teeth) and from *A. javanicum* (Blume) Wangerin in its thicker leaves that dry medium brown, sparse and reticulate tertiary venation and conspicuously asymmetric leaf base (*A. javanicum* has thinner leaves typically drying olive brown to purple brown, regularly conspicuous scalariform tertiary venation and typically symmetric leaf base). The new species also differs by its

glabrous calyx and fruit from both *Alangium havilandii* and *A. javanicum*, which have a velvety hairy calyx and fruit. – TYPE: Brunei, Belait, Sungai Liang, Andulau Forest Reserve, trail entrance to Compartment 7, mixed dipterocarp forest, 21 March 2007, *Yusop BRUN 22161* (holotype BRUN; isotype SING). (Fig. 1)

Small tree 10–12 m tall, trunk 8 cm diameter. ***Leaves*** elliptic, 6.5–17 cm long, 2.7–6.6 cm wide, base cuneate, asymmetric, apex cuspidate (cusp 5–12 mm long), coriaceous, glabrous, drying medium brown; midrib sunken on upper surface, prominent on lower surface, secondary veins 7–9 pairs, tertiary venation sparse and reticulate; petioles 4–7 mm long, 1–1.5 mm diameter, slightly channelled on upper side. ***Flowers*** not known. ***Infructescence*** a short cyme, peduncle 3–6 mm long, with 1–3(–4) fruits. ***Fruits*** on short pedicels 4–5 mm long, 1–1.5 mm diameter; ovoid-ellipsoid, slightly compressed with 10 longitudinal ridges and grooves, 1.8–2.2 cm long, 1.2–1.4 cm wide; glabrous, crowned by the persistent calyx limb and disc; calyx tube subtruncate, 1.5–2 mm high, glabrous. ***Seeds*** one per fruit, ellipsoid-compressed, 1.2–1.3 cm long, 0.8–0.9 cm wide, 2–3 mm thick, testa smooth.

Etymology. 'Kayu' refers to tree or wood in Brunei Malay; this species is named for Mohd. Niga bin Abdullah Nangkat, formerly Senior Forestry Assistant with the Brunei National Herbarium and now retired, who led many collecting trips in Brunei forests.

Distribution. This would seem to be a very rare and narrow endemic in Brunei as it is only known from the type collection.

Provisional IUCN conservation assessment. Data Deficient (DD) as it has only been collected once and no information is available on its distribution or population size. Further field observations would enable a better understanding of its conservation status in Brunei.

Additional specimens examined. The species is only known from the type.

Notes. The slightly compressed ovoid-ellipsoid fruit, with longitudinal ridges and grooves and crowned by the persistent calyx limb and disc, is characteristic of *Alangium* (Bloembergen, 1935, 1939). The most recent revision of Bornean *Alangium* was by Berhaman (1995), in which ten species were recognised for the island. Of these, two are climbers and another six have 3–5-veined leaf bases, characters not found in our new species. Instead, it more closely resembles *Alangium havilandii* (with asymmetric leaf bases and a swamp habitat) and *A. javanicum* (with symmetric leaf bases and a mixed dipterocarp forest provenance). However, the glabrous calyx and fruit surface of *Alangium kayuniga* is consistent for both younger and more mature fruit, whereas in *A. havilandii* and *A. javanica* the velvety nature of the calyx and fruit surface is evident from young stages and persistent through to mature fruit.

Fig. 1. *Alangium kayuniga* K.M.Wong, fruiting branch. (Photo: Muhammad Ariffin)

MELASTOMATACEAE

Melastoma ariffinii K.M.Wong, **sp.nov.**
This new species resembles *Melastoma stenophyllum* Merr. in having linear leaves and broad-triangular hypanthium scales that are less than three times as long as their width, but differs in its hypanthium scales that are subulate and basally inflated with subentire to sparsely denticulate margin, and which are more sparsely set and intermixed with minute similar scales (in contrast to the irregularly short-fringed flat hypanthium scales that are of one general size and closely overlapping in *M. stenophyllum*). – TYPE: Tutong, Ramba, Ulu Tutong, down valley to SW of helicopter pad LP 239, 4°25′N 114°50′E, 150–200 m asl, 8 May 1992, *Johns, Niga, Shanang & Han 7547* (holotype BRUN; isotype K). (Fig. 2A–B)

Melastoma polyanthum var. *linearifolium* Bakh.f., Meded. Bot. Mus. Herb. Rijks Univ. Utrecht 91: 69 (1943). – TYPE: Borneo, Gunong Narik, Kelam, May 1894, *Molengraaff B3460* (lectotype L, designated here).

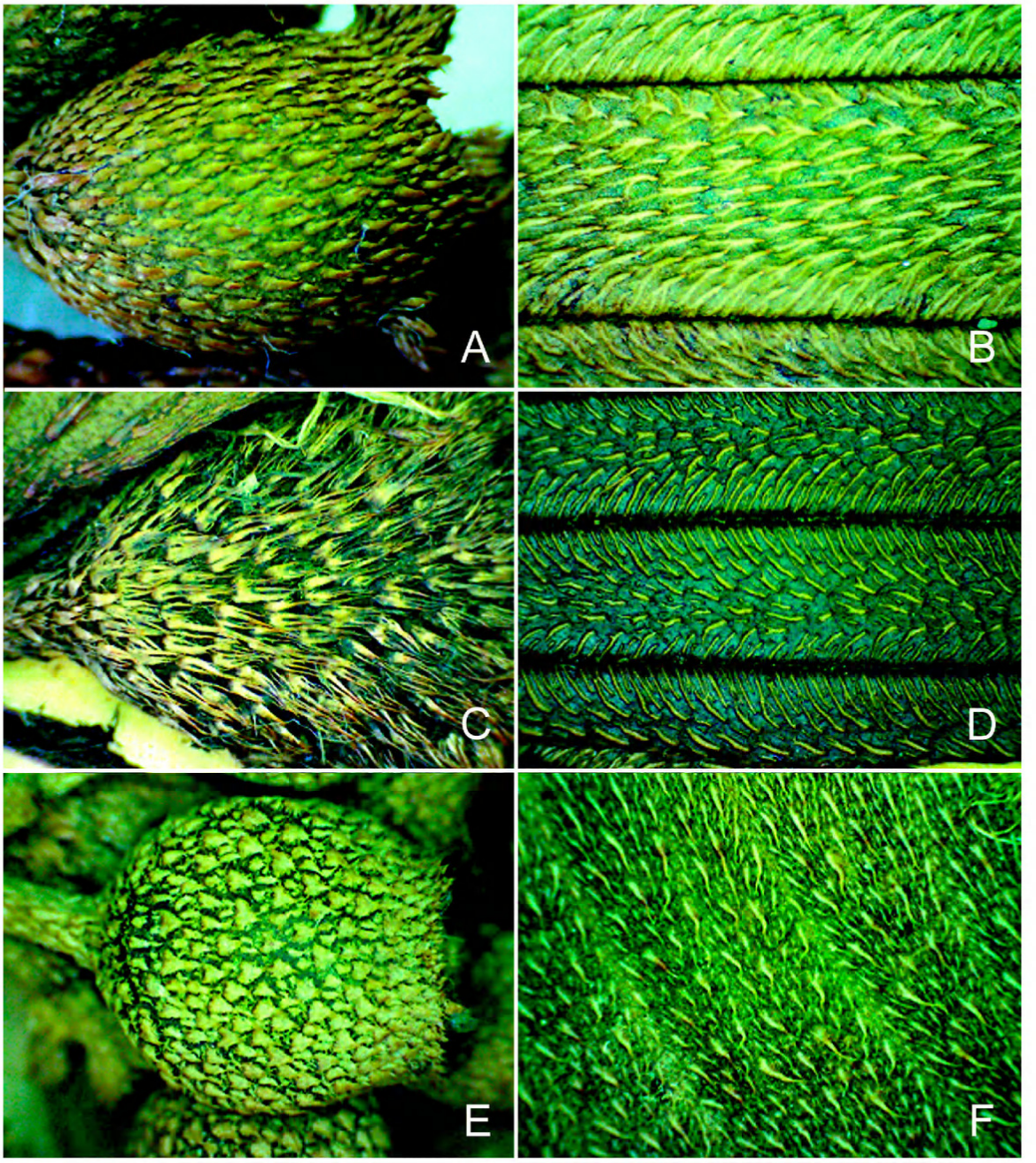

Fig. 2. Hypanthium scale types and detailed view of upper leaf surfaces in *Melastoma ariffinii* (A, B), *M. ashtonii* (C, D) and *M. joffrei* (E, F). A & B from *Othman et al. S 56078*; C & D from *Ashton BRUN 5629*; E & F from *Wong & Joffre WKM 3207* (all SING). (Photomicrographs: Y.W. Low)

Rheophytic bush 1–1.5 m high or more. ***Branch internodes*** covered with dense, appressed, ovate-lanceolate, subentire to slightly short-serrate scales. ***Leaves*** with petioles 0.4–2 cm long, c. 0.1 cm diameter; blades linear, 3.2–10 cm long, 0.4–1.5 cm wide, the 3 longitudinal veins sunken on the upper surface and prominent on the lower surface, covered by a mixture of larger lanceolate appressed scales (c. 1 mm long) and smaller appressed lanceolate scales (<0.3 mm long), lamina on the upper surface

in dried material with abundant conspicuous elongate spicule-like patterns formed by rows of pale crystalliferous cells, glabrous or occasionally with micro-hairs less than 0.1 mm long (Fig. 2B), on the lower surface with scabrid scales with emergent scabrid tips to 0.1 mm long. ***Flowers*** 1–3 in short cymes, peduncle 3–5 mm long, branches 1–2 mm long only; pedicels 4–6 mm long; hypanthium (Fig. 2A) 5–7 mm long, 4–6 mm diameter, green then magenta, with sparsely arranged scales, the scales subulate and basally inflated, to 2 mm long, with entire to sparsely denticulate margins, intermixed with minute similar scales mostly 0.5–1 mm long or shorter, lobes 5, broad-triangular, 5–6 mm long, alternating with inter-sepalar protuberances 1–2 mm long; petals obovate, c. 2.5 cm long, 1.8 cm broad, mauve; stamens not seen. ***Fruits*** c. 9 mm long, 8 mm diameter, green to reddish brown.

Etymology. The species is named after Muhammad Ariffin A. Kalat, experienced forest botanist at the Brunei National Herbarium.

Distribution. This is apparently the common rheophytic *Melastoma* species in clearwater streams of the Northwest Borneo region, including Brunei, Sarawak and W Kalimantan.

Provisional IUCN conservation assessment. Least Concern (LC) as the species is common and widespread. Besides that, the habitat in Brunei is also protected in Forest Reserves and a National Park.

Additional specimens examined. BRUNEI: **Temburong:** First big waterfall on R. Temburong, c. 500 ft, 6 Nov 1959, *Ashton BRUN 759*, (BRUN, K, SING). MALAYSIA: **Sarawak:** 5th Division, Ulu Lawas, Kota Forest Reserve, on bank of Sg. Kota, 21 Oct 1971, *Chai & Ilias S 31110* (A, K, L, SAN, SAR, SING); Kapit Division, Balleh, Ulu Mengiong, Sg. Entejum, 27 Oct 1988, *Othman, Rantai & Jugah S 56078*, (K, KEP, L, SAR, SING); Kapit Division, Sg. Belaga at upper rapids, 12 Apr 1963, *Ashton S 18242* (K, L, SAR, SING).

Notes. Meyer (2001) had apparently not studied specimens of this rheophytic *Melastoma* taxon in Borneo; none bears his annotation or are mentioned or indexed in his revision. He placed *Melastoma polyanthum* var. *linearifolium* Bakh.f. in the synonymy of *M. malabathricum*, but the variety has not hitherto been lectotypified. The syntypes are *Molengraaff B3460* from Mount Kelam in W Kalimantan (L) (which is our *M. ariffinii* here) and *Seimund* s.n. from Kwala Teku in the Malay Peninsula (K: K000867833) (which is a narrow-leafed rheophytic form of *M. malabathricum*). Ridley's *Melastoma polyanthum* var. *angustifolium* (Ridley 1922: 765, as *'angustifolia'*) was applied to this Malay Peninsula taxon and requires lectotypification (to be addressed in a separate review of the Malayan species), but in any case is different from our new species here. Here we lectotypify *Melastoma polyanthum* var. *linearifolium* with the Bornean specimen, as Bakhuizen's work addressed mainly the Netherlands East Indies (Bakhuizen van den Brink Jr., 1943).

The Sumatran rheophyte *Melastoma stenophyllum* was also reduced by Meyer (2001) to synonymy under *M. malabathricum* L. although it is, in our view, quite

distinct: not only because the leaves are stenophyllous in an extreme manner, with blade lengths 9–11 times the width (much more linear than narrow variations of the typically elliptic leaves in *M. malabathricum* which has blade lengths 5–7(–8) times the width), but also the flowers are typically solitary (compared to cymes of several to 7–9 flowers in *M. malabathricum*).

Steenis (1981) confused *Melastoma ariffinii* with *M. borneense* (Cogn.) Bakh.f., which is typified by a collection from West Kalimantan: *De Vriese 168* (L). The *De Vriese* collection has leaves just 1.3–2.2 cm wide, but still clearly elliptic in shape, and not sufficiently linear as in the truly rheophytic taxa; *Melastoma ariffinii* here has leaves that are linear and only 0.4–1.5 cm wide (length 8–10 times the width). Also, the *De Vriese* specimen has 2–7 flowers in a cyme, and a hypanthium with short-fringed, flat ovate-triangular scales, whereas *Melastoma ariffinii* has only 1–3 flowers and hypanthium scales that are subentire to remotely denticulate, and subulate inflated structures. Lastly, the upper leaf surface has scabrid hairs 0.3–0.5 mm long in *Melastoma borneense* but subglabrous with only occasionally scabrous micro-hairs less than 0.1 mm long in *M. ariffinii*, so that the latter's upper leaf surface is not scabrid to the touch. We agree with Meyer (2001) that *Melastoma borneense* is synonymous with *M. malabathricum*; the two taxa have the same hypanthium scales and leaf upper surface characters, among others.

Melastoma ashtonii K.M.Wong, **sp.nov.**

This new species resembles *Melastoma stenophyllum* Merr. in having linear leaves, but differs in its hypanthium scales that are basally thickened and deeply incised into linear segments (Fig. 2C) (in contrast to the fringed flat ovate-triangular scales on the hypanthium in *M. stenophyllum*). – TYPE: Brunei, Belait, Sg. Ingei, rocky river bank, 21 January 1959, *Ashton BRUN 5629* (holotype BRUN; isotypes K, L, SAR, SING). (Fig. 2C–D)

Rheophytic bush 1–2 m high, stems sometimes gnarled. ***Branch internodes*** covered with dense, appressed, ovate-lanceolate, subentire to slightly short-serrate scales. ***Leaves*** with petioles 0.5–1.4 cm long, c. 0.1 cm diameter; blades linear, 3.5–9 cm long, 0.4–1 cm wide, the 3 longitudinal veins sunken on the upper surface and prominent on the lower surface, covered by a mixture of larger lanceolate scales 0.5–1.2 mm long and smaller lanceolate scales 0.2–0.3 mm long, lamina on the upper surface in dried material with abundant conspicuous pale elongate rows of crystalliferous cells forming spicule-like patterns and quite glabrous (Fig. 2D), on the lower surface with scabrid scales with 0.2–0.3 mm emergent scabrid tips. ***Flowers*** 1–3 in short sessile cymes, branches 1–2 mm long only; pedicels 1–4 mm long; hypanthium 10–11 mm long, 7–8 mm diameter, green then crimson, moderately to densely scaly, the scales with an entire thickened base 0.1–0.2 mm high and linear segments 0.6–1.4(–2) mm long, lobes 5, narrowly triangular, 8–10 mm long, alternating with inter-sepalar lobes 4–5 mm long; petals obovate, c. 3.3 cm long, c. 2 cm wide, mauve; short stamens with a filament c. 7–8 mm long and anthers c. 5 mm long and 2.5–3 mm wide, with

apiculate tips, long anthers only one seen, filament unknown, anther c. 12 mm long. ***Fruits*** (young) c. 8 mm long, 4 mm diameter, green to reddish brown.

Etymology. The species is named after Professor Peter Shaw Ashton, Brunei's first Forest Botanist who collected the type on his first assignment to the tropics, and who later taught at Aberdeen and Harvard Universities.

Distribution. Known only from the Sungai Ingei area in Brunei.

Provisional IUCN conservation assessment. Least Concern (LC) as the habitat of the species is well protected in the Sungai Ingei Conservation Area, which is also now included within the designated Heart of Borneo area within Brunei.

Additional specimens examined. BRUNEI: **Belait:** Falls just upstream from Batu Melintang, 4 Jan 1989, *Wong WKM 680* (BRUN, K, SING).

Notes. See comments under *Melastoma ariffinii* above. The new rheophytic species here, *Melastoma ashtonii*, is also clearly different from *M. malabathricum* by its hypanthium scale type: basally thickened scales that are deeply incised into linear segments, often resembling miniature rakes, instead of the irregularly short-serrate to shallowly laciniate flat narrowly triangular-lanceolate scales as in *M. malabathricum* (Fig. 3). Also, in both *Melastoma malabathricum* and *M. stenophyllum*, the pale spicule-like patterns formed by rows of crystalliferous cells embedded in the upper leaf surface are distally continuous with short scabrid hairs, but the upper laminar surface in *M. ashtonii* is quite glabrous. In addition, *Melastoma ashtonii* has rather conspicuous inter-sepalar lobes 4–5 mm long, compared to the much less conspicuous ones that occasionally occur in *M. malabathricum*, absent altogether in *M. stenophyllum*.

Steenis (1981: 283) had already noticed the potential novelty of this taxon, which he enumerated as "Melastoma *sp.* (*nov.?*)" in his *Rheophytes of the World*.

Melastoma joffrei K.M.Wong & Y.W.Low, **sp.nov.**
This species is unique among *Melastoma* species with isomorphic stamens by its hypanthium covered by small triangular scales of different sizes (Fig. 2E) (not hairlike bristles as in *M. cynoides* Sm. and *M. moluccanum* Blume, nor penicillate emergences as in *M. montanum* (Lauterb.) K.Meyer), very small bracts that do not enclose the hypanthium (unlike in *M. montanum*), and scabrid upper leaf surfaces with a mixture of longer and tiny coarse suberect to upcurved hairs (Fig. 2F) (not strigose to appressed pilose upper leaf surfaces as in the other species). – TYPE: Brunei, Tutong district, Rambai, Ladan Hills Forest Reserve, on ridge NE of campsite beside Sungai Buing, along old logging track, 13 October 2012, *Wong & Joffre WKM 3207* (holotype BRUN; isotype SING). (Fig. 2E–F, 4)

Treelet (single-stemmed) or shrub (with several stems from the base) to 1.5 m high. ***Branch internodes*** coarse with dense, spreading to erect small triangular scales.

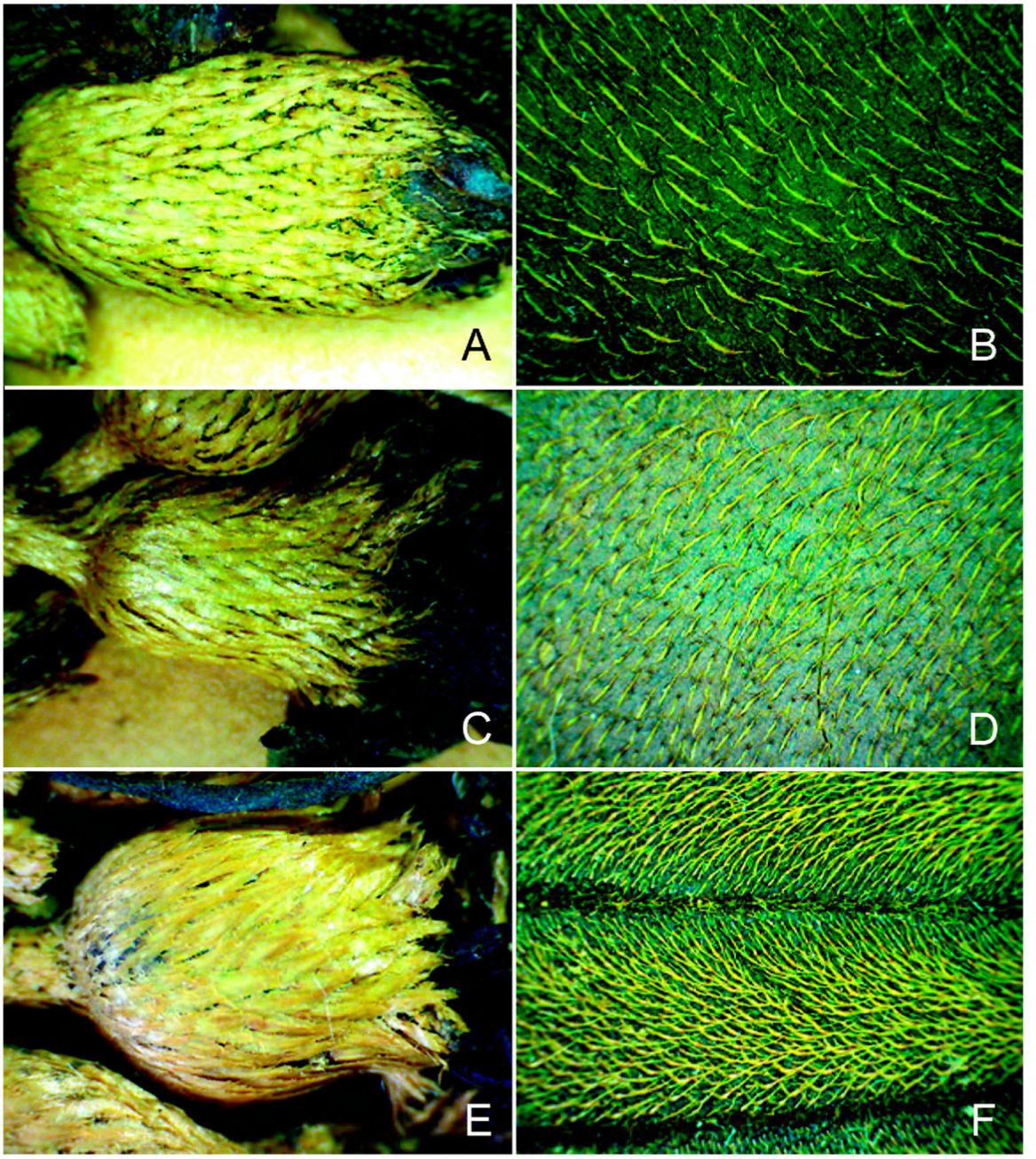

Fig. 3. Consistently narrowly lanceolate, serrate-laciniate and densely overlapping hypanthium scales, and scabrid-hairy upper leaf surfaces in *Melastoma malabathricum* from the Malay Peninsula (A, B), Sabah (C, D) and Sarawak (E, F). A & B from *Jagoe s.n.*; C & D from *Kadir A 2855*; E & F from *Moulton 6723* (all SING). (Photomicrographs: Y.W. Low)

Leaves with petioles 0.6–2 cm long, with a mixture of scattered to dense suberect short scales and scabrid hairs; blades ovate-elliptic, 5.5–12.5 cm long, 1.5–4.5 cm wide, longitudinal nerves 3–5(–7), sunken on upper surface, raised on lower surface and bearing a mixture of suberect short scales and scabrid hairs, transverse veins between the nerves scalariform, slightly sunken on upper surface, raised on lower surface;

Fig. 4. *Melastoma joffrei* K.M.Wong & Y.W.Low. Open flowers showing isomorphic stamens. Inset: Detail of upper leaf surface showing different hair types contributing to a sandpapery roughness. All from *Wong & Joffre WKM 3207*. (Photos: K.M. Wong)

upper laminar surface with a mixture of longer and tiny coarse suberect to upcurved hairs, scabrid-sandpapery to the touch; lower laminar surface similarly scabrid. ***Inflorescence*** a compact terminal cyme of (7–)9–13 flowers, main cyme branches 3–11 mm long, bracts tiny, broad triangular to semicircular, c. 1 mm long and wide. ***Flowers*** small, only c. 2 cm across; hypanthium urceolate, 4.5–5 mm long, 4.5–5 mm wide, surface scales short triangular, appressed, margins minutely denticulate, not or only slightly imbricate and not entirely obscuring the hypanthium surface, green; calyx lobes 5, broadly triangular, 1.5–2.5 mm long, 1–2 mm wide; petals 5, obovate, 6–7.5 mm long (8–9 mm in fresh material), 4–5.5 mm wide (5–6 mm in fresh material), the apex subtruncate to rounded, margins short-ciliate, pale purple-pink; stamens 10, isomorphic, filaments 3–4 mm long (3.4–4.5 mm in fresh material), white, each apically bearing two knoblike pale yellow appendages at the insertion of the anther, anthers erect, 2–2.5 mm long (2.5–3 mm in fresh material), pale creamy yellow, apex rounded, opening by apical pores; style slender-cylindric, 4.5–5.5 mm long (5.5–7 mm in fresh material), with a pale green base, then pink for the most part, apically pale yellow; stigma rounded to subtruncate, 4–5-lobed, pale green. ***Fruit*** urceolate to subglobose, 5.5–6 mm long, 5.5–6 mm wide, dehiscing irregularly transversely.

Etymology. The species is named for our colleague Joffre bin Haji Ali Ahmad, Forest Botanist at the Brunei National Herbarium and experienced and long-time collector of Brunei plants.

Additional specimens examined. BRUNEI: **Tutong:** Rambai, Ladan Hills Forest Reserve, Sg. Buing, disturbed mixed dipterocarp forest, on ridge, 29 Oct 2013, *Ariffin, Low, Y.W. & Azlan BRUN 23229* (BRUN, SING). MALAYSIA. **Sarawak:** Tatau district, Anap, Muput Kanan, Ulu Naoung, 6 m asl, 14 Oct 1963, *Ashton S 19569* (A, BO, K, KEP, L, SAN, SAR, SING).

Distribution. Known only from the type locality in Brunei and another collection in Sarawak's Tatau district.

Provisional IUCN conservation assessment. Data Deficient (DD) as it has been only twice collected with one of the collections made over 50 years ago. Field observations are badly needed for a better understanding of its conservation status.

Notes. In Meyer's revision of *Melastoma* (Meyer, 2001), there is a small group of three *Melastoma* species with isomorphic stamens, *M. cynoides*, *M. moluccanum* and *M. montanum*, which he recognises for the more seasonal parts of insular SE Asia and New Guinea; the rest of the species in the genus have flowers with dimorphic stamens. *Melastoma joffrei* is Borneo's first known *Melastoma* species with isomorphic stamens.

RUBIACEAE

Lasianthus jangarunii Y.W.Low, **sp. nov.**

This new species resembles *Lasianthus linearifolius* H.Zhu in having linear leaves but differs by having triangular stipules, bullate leaves with a thin-papery and crispy texture, a revolute margin and brochidodromous venation (with 17–40 pairs of secondary veins forming a distinct marginal vein), and a calyx with shorter tube (c. 0.4 mm long) and shorter lobes (c. 0.4–0.9 mm long). In contrast, *Lasianthus linearifolius* has awl-shaped (subulate) stipules, leaves with a plane surface and leaf margin, subcoriaceous texture, craspedodromous venation (with 10–16 pairs of secondary veins), and a calyx with longer tube (c. 1 mm long) and longer lobes (c. 1 mm long). – TYPE: Brunei, Temburong, Amo, Sungai Temburong and Sungai Machang junction, ridge, 120–250 m alt., 18 September 1990, *Puff et al. 900818-1/11*, mature fruits (holotype BRUN; isotypes K, SAR, SING 2 sheets). (Fig. 5)

Understorey treelet c. 2 m high, stem c. 3–4 mm wide. ***Branches*** solitary, slender, terete, c. 1–2 mm wide, sparsely puberulent to subglabrous. ***Stipules*** narrowly triangular, c. 1–3 mm long, sparsely puberulent. ***Petiole*** 4–6(–7) mm long, 0.8–1.2 mm wide, sparsely puberulent. ***Leaf*** lamina linear, (8.5–)11–13.7(–18.4) cm long, (0.8–)1–1.5(–2.2) cm wide, bullate, thin-papery and crispy; leaf base cuneate; leaf apex long-caudate; leaf margin entire to slightly repand, revolute; midrib prominent

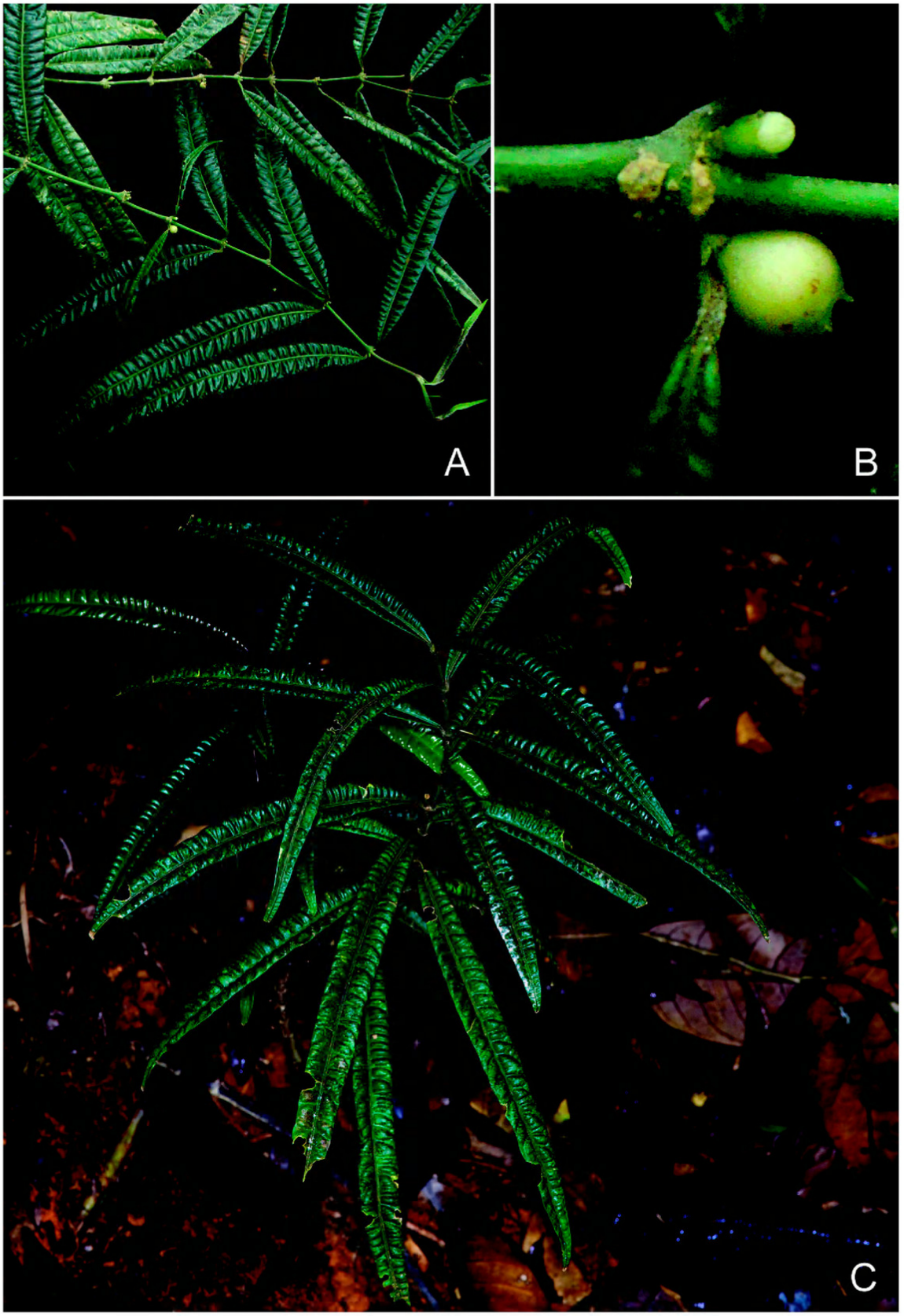

Fig. 5. *Lasianthus jangarunii* Y.W.Low. **A.** Branches with conspicuously corrugated leaves. **B.** Close-up of a flower bud and an immature fruit with persistent calyx lobes visible. **C.** Habit (Ulu Temburong National Park). All from *Low et al. LYW 629*. (Photos: A–B: K.M. Wong, C: Y.W. Low)

and glabrous on both sides; secondary veins 17–40 pairs, making an angle of 85–90° with the midrib and joining to form a distinct marginal vein, inconspicuous to slightly raised and glabrous on upper side, prominent and glabrous on lower side; tertiary venation inconspicuous to slightly raised on upper side, inconspicuous on lower side. ***Inflorescences*** sessile; bracts absent. ***Flowers*** fascicular, sessile; calyx campanulate, tube c. 0.4 mm long, outside surface puberulent; marginal lobes 4(–5), triangular, c. 0.4–0.9 mm high; corolla hypocrateriform, white; tube c. 1 mm long, outside puberulent; lobes 4(–5), triangular, c. 1.2 mm long, c. 1 mm wide, valvate, outside puberulent. ***Drupes*** subglobose, c. 2–3 mm long, 2.5–3 mm wide, 4(–5)-ridged when dry, puberulous, maturing black (*Kirkup et al. 898*); calyx persistent at fruit apex, with 4(–5) small triangular calyx lobes. Pyrenes 4(–5), thick-walled, each with a single seed.

Etymology. This species is named for Jangarun anak Eri, knowledgeable field assistant and tree climber attached to the Brunei National Herbarium (BRUN), who has assisted numerous botanists with fieldwork.

Distribution and habitat. Lasianthus jangarunii is endemic to northwest Borneo (Brunei: Temburong district, and Sarawak: Marudi district), where it grows on clay-rich sedimentary soils as an understorey treelet on steep slopes of mixed dipterocarp forest.

Provisional IUCN conservation assessment. Least Concern (LC) as the species is protected in the Ulu Temburong National Park in Brunei and, although only collected twice, in Sarawak it is recorded from Pulong Tau National Park where the habitat is also protected.

Additional specimens examined. BRUNEI: **Temburong:** Amo, Kuala Belalong ('Kuala Temburong' on label), hill, 21 Jul 1988, *Wong WKM 253*, leafy branch (BRUN, K, SING), Batu Apoi Forest Reserve, on slope along Sungai Engkiang, 20 Nov 1991, *Hansen 1592*, young fruits (BRUN); Amo, Ulu Belalong, LP 382, ridge top, 22 Jan 1994, *Kirkup et al. 898*, young fruits (BRUN); Amo, Ulu Temburong National Park, hill behind Lubok Umar, ridge, 18 May 2014, *Low et al. LYW 629*, flower buds (BRUN, K, L, SAN, SING). MALAYSIA. **Sarawak:** Marudi, Pulong Tau National Park (western part), Ulu Sungai Baong, on steep slope, 931 m asl, 10 May 2007, *Sang et al. S 98058*, young fruits (K, KEP, L, SAN, SAR, SING); ibidem, trail along the ridges to Bukit Tenidan, 11 May 2007, *Muliati et al. S 97911*, fruits (KEP, SAR).

Notes. Davis in Coode et al. (1996) identified this species as a taxonomically distinct entity of *Lasianthus* from Temburong, which was listed only as *Lasianthus* "sp. 7". Zhu et al. (2012) evidently overlooked Coode et al. (1996) and this species while preparing for the revision of Malesian *Lasianthus*; he stated that only "a selection of the Malesian collections in the herbaria BKF, KEP, MO, and SING" had been consulted. A recent collection from Ulu Temburong National Park (*Low et al. LYW 629*) matched *Lasianthus* "sp. 7" of Davis (Coode et al., 1996), and is distinct from all other *Lasianthus* taxa recognised by Zhu et al. (2012). This is so far the only known *Lasianthus* species in Malesia with strongly bullate and linear leaves.

Table 1. Comparison of morphological characteristics and distribution between *Lasianthus jangarunii* Y.W.Low and *L. linearifolius* H.Zhu.

Lasianthus jangarunii	***Lasianthus linearifolius***
Stipules triangular	Stipules awl-shaped (subulate)
Leaves bullate	Leaves smooth
Leaf texture thin-papery and crispy	Leaf texture subcoriaceous
Leaf margin revolute	Leaf margin plane
Secondary veins 17–30 pairs	Secondary veins 10–16 pairs
Loop-veined secondary venation (brochidodromous)	Secondary venation emerging from the midrib running towards and terminating at the leaf margin (craspedodromous)
Calyx tube c. 0.4 mm long	Calyx tube c. 1 mm long
Calyx lobes c. 0.4–0.9 mm long	Calyx lobes c. 1 mm long
Restricted to northwest Borneo (Brunei: Temburong district, and Sarawak: Marudi district) on clay-rich sedimentary soils	Restricted to Mount Kinabalu (Malaysia: Sabah) on ultramafic soil

Lasianthus jangarunii differs from *L. linearifolius*, which also has linear leaves, by its stipules, leaf texture and venation, and calyx dimensions (see diagnosis above). The character-states are compared in Table 1.

Apart from that, *Lasianthus jangarunii* is restricted to northwest Borneo (Brunei: Temburong district, and Sarawak: Marudi district) on clay-rich sedimentary soils, whereas *L. linearifolius* is endemic to Mount Kinabalu (Sabah) growing on ultramafic soil.

Lasianthus has some consistent characters that are easily recognised, when adequate material permits, such as paired axillary inflorescences and pyreniferous blue fruits (as in the type *L. cyanocarpus* Jack, but there are some species with white, red or black fruits). In addition, *Lasianthus* spp. are more typically treelets in the forest understorey with only solitary (not paired) primary branches developing along the vertical stem. This branching feature was not noted in Zhu et al. (2012) but is nevertheless important and represented in more recent collections of the genus; a good example was illustrated for *Lasianthus pedicellatus* H.Zhu in Zhu et al. (2012: 72, Fig. 30).

New plant records for Brunei

LECYTHIDACEAE

Planchonea valida (Blume) Blume

BRUNEI. **Temburong:** Amo, Kuala Belalong, Field Study Centre, 24 Apr 1998, *Joffre BRUN 19016* (BRUN).

This is a new tree genus and species record for Brunei, collected after the publication of Coode et al. (1996).

Provisional IUCN Conservation Assessment. Data Deficient (DD) for Brunei as the species is only known from a single collection from Kuala Belalong. Further field observations are needed for a better understanding of its conservation status in Brunei.

MELASTOMATACEAE

Melastoma velutinosum Ridl.

BRUNEI: **Belait:** Labi, Labi Forest Reserve, Compt 49, Ulu Sungai Rampayoh, 19 May 2009, *Yusop BRUN 22636* (BRUN); Melilas, Ulu Ingei hotsprings, 4°08'N, 114°43'E, 20 m asl, 7 Mar 1996, *Joffre BRUN 17295* (BRUN, SING). **Tutong:** Rambai, Ladan Hills Forest Reserve, Bukit Bedawan, northwest of LP 263, 4°29′33″N 114°48′52″E, 250 m asl, 28 Mar 1997, *Joffre BRUN 18147* (BRUN, SING).

This species is known for the Malay Peninsula and Borneo (Sabah and Sarawak) (Meyer, 2001). The several collections here record it for Brunei for the first time.

It is a treelet (single-stemmed) or shrub (with several stems from the base) to 3 m high. Distinctive features include the branch internodes that are hirsute with dense, spreading to curved long bristles; ovate-elliptic leaves with 3–5(–7) longitudinal nerves and an upper lamina surface that is appressed-pilose (hairs to 0.5 mm long), slightly velvety to the touch; a compact terminal cyme of 3–7 small flowers (only 2 cm across in dried material); and a hypanthium densely covered by slender bristles 3–5 mm long.

Provisional IUCN conservation assessment. Least Concern (LC) for Brunei as the species is common. This species occurs throughout northwest Borneo.

RUBIACEAE

Gardenia costulata Ridl.

BRUNEI: **Belait:** Andulau, without date, *Ashton A2865* (BRUN). **Temburong:** Bukit Patoi, without date, *Ashton 3970* (BRUN).

Gardenia costulata Ridl. was first described by Ridley (1934) based on a single collection (*Beccari 1986*, K, BM) from Sarawak. While reviewing Sundaland *Gardenia*, Low (2010) enumerated additional materials of *G. costulata*, including a collection for Sabah (*Madius SAN 50094*) and Kalimantan (*Hallier B1285*), most of which had been erroneously identified as *G. pterocalyx* Valeton in many herbaria. *Gardenia costulata* has truncate stipules with a revolute margin, and thin-coriaceous leaves with an acuminate to long-cuspidate apex and a pubescent lower leaf surface. These vegetative features adequately permit its distinction from *G. pterocalyx*, which also has truncate stipules but with a plane margin, and thicker leaves with a typically rounded apex and a glabrous lower leaf surface. Although the two Brunei specimens at the Brunei Herbarium were without flower or fruit, it was possible to match these two specimens to *G. costulata* based on the distinctive stipule character, the shape of the leaf apex, the leaf texture, and the presence of pubescence. Apart from morphological characters, the *kerangas* vegetation at Bukit Patoi in Brunei where *Ashton 3970* was collected also matches the habitat known for other specimens of *G. costulata*.

Gardenia costulata is restricted to Borneo, and so far has only been recorded from *kerangas* forest. The habitat of *Ashton A2865* from Andulau is not known, although the main habitat type recorded for Andulau is Mixed Dipterocarp Forest (Ashton, 1964).

Provisional IUCN conservation assessment. Data Deficient (DD) for Brunei as the species is only known from two localities, namely Andulau (Belait District) and Bukit Patoi (Temburong District). Field observations are badly needed for a better understanding of its conservation status in Brunei.

ACKNOWLEDGEMENTS. The Ministry of Industry and Primary Resources and the Forestry Department, Brunei Darussalam, and the Singapore Botanic Gardens, National Parks Board, Singapore, provided the opportunity and funding for this work. For special field coordination and assistance, we thank Noralinda binti Haji Ibrahim, Roslinah binti Haji Mohsin (Forestry Department), Joffre Haji Ali Ahmad, Muhd. Ariffin A. Kalat, Watu bin Awok, Jangarun anak Eri, Azlan bin Pandai, Muhammad Waffiuddin bin Zainol Ariffin and Rauzaidi bin Mureh (BRUN); Serena Lee, Paul K.F. Leong and Paul Parusuraman Athen (SING). We are grateful to the keepers and curators of the BO, BRUN, L, SAN, SAR and SING herbaria for facilitating study of specimens in their care.

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