Feddes Repertorium

WILEY-VCH

RESEARCH ARTICLE OPEN ACCESS

The Linear-Leaved *Dracaena* Complex (Asparagaceae) in Borneo, With 13 New Species

Pui Kiat Hoo[1] | Sin Yeng Wong[1] | Khoon Meng Wong[2]

[1]Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak, Malaysia, Malaysia | [2]Singapore Botanic Gardens, National Parks Board, Malaysia, Singapore

Correspondence: Pui Kiat Hoo (puikiatben@gmail.com)

Received: 9 February 2026 | **Revised:** 26 May 2026 | **Accepted:** 29 May 2026

Keywords: *Dracaena angustifolia* | horticulture | leaf base | morphology | vegetative growth

ABSTRACT

The Bornean *Dracaena* are morphologically diverse, enabling the recognition of a highly distinctive group here referred to as the "linear-leaved *Dracaena* complex" which includes species with leaves that are grass-like with ratios of blade length to maximum width > 10. The complex is represented by 16 species in Borneo, of which 13 are newly described. Important morphological characters used in species delimitation including vegetative growth (continuous vs. episodic) and leaf base (pinched vs. pseudopetiolate vs. broadly laminate) are illustrated and discussed. Furthermore, the name "*Dracaena angustifolia*" that was previously attributed to the Bornean taxa is shown to be erroneous. A key to the linear-leaved *Dracaena* of Borneo is provided.

1 | Introduction

Dracaena Vand. ex L. (including *Pleomele* Salisb. and *Sansevieria* Thunb.; POWO, 2025, see also Lu and Morden 2010, 2014; Wong 2023) is listed with some 700 binomials in the International Plant Names Index (IPNI 2025), but estimated to include only about 200 species (POWO 2025). The clarification of this group therefore suggests a formidable task. Distributed from Africa through tropical and subtropical Asia to the Pacific and the New World, the genus has recently been revised for Sulawesi (Indonesia) but remains understudied in much of Southeast Asia, where, nevertheless, new species from Thailand and Myanmar have been diagnosed (Wilkin et al. 2012, 2013; Damayanto et al. 2026).

Confronted with the potentially mammoth task of investigating *Dracaena*, we decided to narrow down to Southeast Asia and use Borneo as a starting platform. This is because Borneo's flora has been much demonstrated to be both highly distinct with regards to taxa representing the smaller size classes (e.g., Wong 2016, 2017; Chen and Wong 2023) and non-tree forms (e.g., Saw 2012), as well as harboring many previously undescribed taxa in various life-forms (e.g., Wong and Sugau 1996), with which we have some familiarity.

Borneo lies on the eastern edge of the Sunda continental shelf in Southeast Asia, the largest island there. It is an acknowledged biodiversity hotspot (Myers et al. 2000; de Bruyn et al. 2014). Moreover, Kier et al. (2005) considered the Borneo lowlands ecoregion as the world's top hotspot as it is the only ecoregion to have over 10,000 plant species, and Barthlott et al. (2007) also rated North Borneo among the top five biodiversity centers in the world. Additionally, Roos et al. (2004), Neo et al. (2021) and Neo (2023) have demonstrated the importance of taxonomic endemism on Borneo island.

Even then, in Borneo, it became obvious that *Dracaena* is represented by several morphologically distinctive groups. The largest such group is represented by species with broad- to narrowly elliptic leaves up to 15–20 cm long borne in clusters and separated by intervals of stem-nodes with reduced leaves or bracts, clearly a manifestation of episodic stem growth and leaf production. Another group with usually very large (more than 15–20 cm long) elliptic to broad-lanceolate leaves

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2026 The Author(s). *Feddes Repertorium* published by Wiley-VCH GmbH.

is not clearly represented on specimens with sufficiently long trimmed leafy segments (that would indicate if they also have the episodic growth characteristics evident in the first group). These two groups do not form the present focus, which instead addresses a third, smaller, group with linear leaves. We define linear leaves as those having ratios of blade length to maximum width > 10, where the leaves generally appear long and grass-like or strap-shaped. In fact, some of such taxa have length: width ratios exceeding 50 and even reaching 90 or more. In Southeast Asia, linear-leaved dracaenas have become popular in horticulture of late (Figure 1), although the hardier forms from seasonal climates and xerophytic environments (such as limestones) with slender thicker leaves should make for elegant and longer-lasting foliage displays. It is believed that the present contribution will reveal similar-looking rainforest *Dracaena* species from Borneo that could have special horticultural value. This group has much horticultural potential, as the small shrubby habit and forest understorey adaptation make these species easy to accommodate in indoor containers and the densely clustered linear leaves are highly distinctive and attractive.

It is interesting that many linear-leaved taxa in Borneo have been wrongly identified or confused with *Dracaena angustifolia* (Medik.) Roxb., even though that species, typified by the drawing of an Amboina plant produced in Rumpf (Rumphius) (1741–1755; 4 (1743): t. 35), has broader leaves with leaf length: width ratios of only 7.1–8.7, and so does not qualify as having linear leaves as we define them here. It is for this reason we do not refer to this complex as the "*Dracaena angustifolia* complex," and prefer to emphasize linear leaves (blade length to maximum width ratios > 10).

Also, in the Bornean forest, one or two forest-floor monocots may present themselves as possible linear-leaved dracaenas, such as *Apostasia* spp. (Orchidaceae). An examination of the leaves will reveal that *Apostasia* has three main longitudinal veins, whereas dracaenas have but one (the "midrib").

2 | Materials and Methods

A general starting point for investigations into the Bornean flora is the enumeration by Merrill (1921). Of the bibliographic listing made, only *Pleomele angustifolia* (Medik.) N.E.Br. (= *Dracaena angustifolia*), *P. graminifolia* N.E.Br. (with *D. finlaysoni* Baker as synonym: a Malayan name referring to a species with unbranched inflorescences and different from the Bornean taxa) and *P. granulata* (Hook.f.) N.E. Br (= *D. granulata* Hook.f., another Malayan name: a species with much-branched inflorescences and sharply attenuated leaf blade bases, not found in Borneo) refer to specimens with linear leaves, as we here focus on. Therefore, these were misidentifications, using names from neighboring territories. In addition, consultation of the IPNI listing revealed that only Merrill (1922) and Ridley (1930) contributed further novelties in the Bornean dracaena flora distinguished by linear leaves, namely, *Pleomele borneensis* Merr. and *Pleomele hosei* Ridl. (= *Dracaena borneensis* (Merr.) Jankalski and *D. hosei* (Ridl.) Jankalski, respectively; Jankalski 2008).

Based on this, Bornean specimens from the herbaria at Sandakan (SAN), Sabah Parks Herbarium (SNP), Brunei (BRUN), Sarawak (SAR), and Bogor (BO), as well as Singapore (SING) and key reference specimens available through



FIGURE 1 | Linear-leaved dracaenas are attractive and sought after as indoor (A) or frontage (B) decorations, as they are much available in Southeast Asia and easy to propagate and maintain. Possibly originating from different countries not often divulged in the horticultural trade and sometimes sold under concocted fanciful names, they are difficult to identify, being often presented without flowering or fruiting material. (Photos: K.M. Wong).

JSTOR (2025), GBIF (2026) or respective herbaria from the Harvard University Herbaria (A), Edinburgh Botanical Garden (E), Royal Botanic Gardens Kew (K), Naturalis Biodiversity Center of the Netherlands at Leiden (L), New York Botanical Garden (NY), National Museum of Natural History (P), and United States National Herbarium (US) were studied. Herbarium acronyms follow Thiers (continuously updated). For Leiden specimens with both a QR code and a barcode, we have prioritized citing the former as it can be easily searched for in BioPortal Naturalis.

Specimen sorting revealed distinct taxa accepted as those with discontinuous morphological gaps. We adopt the Biological Species Concept of Mayr (1942), where species are accepted as "groups of interbreeding natural populations that are reproductively isolated from other such groups". Following this, discontinuous morphological gaps are taken to reflect a lack of gene flow which prevents two lineages from homogenizing (Coyne and Orr 2004; Mallet 2008).

3 | Results

3.1 | About *Dracaena angustifolia*

Dracaena angustifolia (Medik.) Roxb. (Fl. Ind. (ed. Carey) 2 (1832) 155–156) is based on "Terminalis angustifolia" in Rumphius, Herb. Amboinense 4, t. 35.

The *Herbarium Amboinense* was published posthumously in 1741. Rumphius was in Ambon from 1654 until his death in 1702, and made a systematic study of Amboinese plants, particularly those of medicinal value. In his listing of plant species, he did not refer to specimens, and under his "Terminalis angustifolia," he only mentioned that this plant was found in Amboina (in today's Indonesia) and popularly used in medicine among the Javanese and Malays. Subsequently, Medikus (1786) published the name *Terminalis angustifolia* Medik., referring to Rumphius' plate, which is therefore regarded as the type drawing. When Roxburgh (1814) combined this name in the genus *Dracaena*, he was aware that it referred to an Amboina plant. He later provided a description of the plant to which he stated that it had been introduced to the Calcutta Botanic Garden in 1798 although no specimen was mentioned (Roxburgh 1832).

The species depicted in Rumphius' Herb. Amboinense 4, t. 35 (Figure 2: reproduction of Rumphius' Plate 35) clearly shows a narrowly lanceolate to elliptic-leaved *Dracaena* in which the leaf length to width ratio (7.1–8.7) is much lower than nearly all of the Bornean taxa we could recognize that have been previously identified with *D. angustifolia* Roxb., which have length: width ratios more than 10, often much more. Moreover, Rumphius' plate also clearly shows the terminal flowering panicle exceeding the leaves in length, as much as 1.5–2 times. Again, the Bornean taxa previously identified with Roxburgh's species have inflorescences that are variable in this regard. They are slightly to several times shorter than the leaves or can exceed the terminal cluster of leaves in an impressive way.

Specimens of *Dracaena* from the Maluku and nearby islands were also examined. Such specimens, which conform



FIGURE 2 | Rumphius 1743 (4) Table 35. (Photo: K.M. Wong).

to Rumphius's illustration, including *Boerlage 84* (BO [BO-1434737]), *van Balgooy 6518* (L [L.3886804]), *Purwaningsih & Sanusi 74* (L [L.1460486]), *Buwalda 4430* (L [L.1460492]), and *Leeuwenberg et al. 14,544* (L [L.3896054]), are here regarded as true *D. angustifolia*. Thus, it has become very clear that none of the Bornean species that have been placed in this complex are identical with *D. angustifolia*, and they should be assigned to other existing names (if available) or recognized as new species. *Dracaena angustifolia* was first applied for Borneo by Rendle, J. Bot. 39 (Rendle 1901) 177, referring to the specimen *Hose 542* (Sarawak) (K: barcode K000401485), which is also cited in Merrill's enumeration of Bornean plants (Merrill 1921). The leaf shape (linear, as defined for this account) is rather different from the type of *D. angustifolia* and is referable to *D. borneensis* (see later). The application of *D. angustifolia* to Bornean material therefore seems erroneous.

3.2 | Variation Among Linear-Leaved *Dracaena* Species in Borneo

Three broad categories of leaf characteristics were found among the linear-leaved species of Borneo (Figure 3). These are distinguished in the key provided later and summarized as follows:

1. A taxon with *pinched leaf bases*—where the leaf blade base has an abrupt short constriction above the sheathing base,

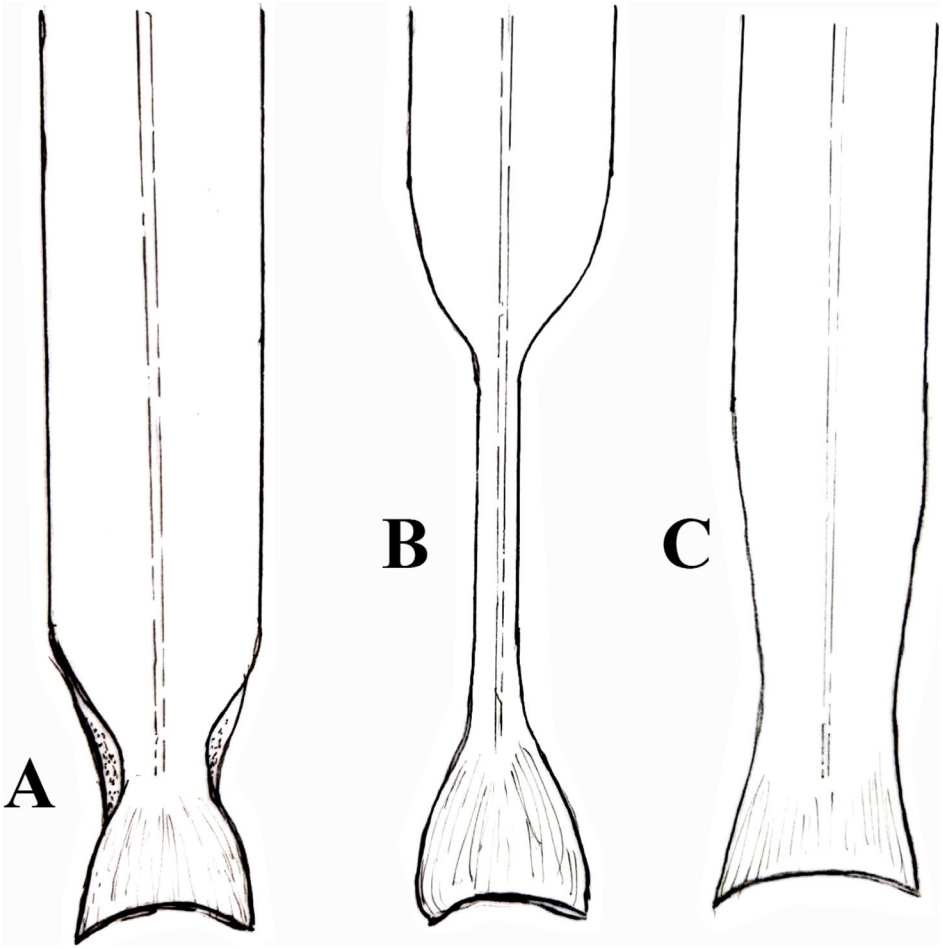

FIGURE 3 | Leaf base types in Bornean *Dracaena* with linear leaves. (Drawing: K.M. Wong) (A) With "pinched" leaf bases, where the leaf blade base has an abrupt short constriction above the sheathing base, the constriction often with infolded blade margins. (B) With pseudo-petiolate leaf bases, where leaf blades are proximally narrowed gradually into a conspicuously slender portion above (and exceeding) the sheathing base, the "pseudo-petiole" with hardly noticeable laminar tissue on both sides of the midrib. (C) With broad-laminate bases right down to the sheathing base, only very slightly narrowed compared to the mid-blade, not "pinched" and not "pseudo-petiolate".

the constriction often with infolded blade margins and appearing "pinched";

2. A *pseudo-petiolate* group—where leaf blades are proximally narrowed gradually into a conspicuously slender portion above (and exceeding) the sheathing base, the "pseudo-petiole" with hardly noticeable laminar tissue on both sides of the leaf mid-vein;
3. A group with *broad-laminate leaf bases*—in which the leaf base is non-pseudo-petiolate, the leaf mid-vein is always with conspicuous laminar tissue on both sides, and the leaf blade base is only very slightly and gradually narrowed, without abrupt constrictions.

Category (1), known for a single species, has continuous vegetative growth. In category (2) there are taxa with ostensibly continuous vegetative growth, where leaves are produced regularly as stem or branch elongation proceeds, or episodic vegetative growth, where normal leaf production is closely clustered along stem or branch segments and alternates with longer segments bearing reduced or often much shorter leaves (Figure 4). Category (3) appears to have only the continuous growth habit. Typically, each new branch also begins with several bract-like or smaller leaves with closer nodes before the typically long leaves develop, spaced slightly farther apart. As such, care should be taken to interpret longer and continuous lengths of axes to determine this characteristic.

In the field, it would be much easier to interpret these growth patterns on stems or branches than from herbarium specimens, as often only short lengths of leafy axes just below the reproductive apex are collected, typically trimmed to fit plant presses and "herbarium-size" sheets. Taxa with episodically developing axes seem often smaller in leaf dimensions and so longer axes are represented in specimens gathered, with better representation of the axis/leaf development sequences. For taxa suspected from herbarium examination to have continuous axis development, two possibilities are present. Those represented by many collections offer the chance for verification, but for the rarer ones (less material) this character is not used in the key or is augmented by other characteristics.

Category (3) includes *Dracaena multiflora* Warb. ex P.Sarasin & Sarasin, a plant of very exposed environments, and typically multiple massive stems (reaching 10 cm or thicker), highly unusual in Borneo (Figure 5). It greatly contrasts with all the other



FIGURE 4 | Continuous vegetative growth in *Dracaena borneensis* (A) vs. episodic growth in *D. bruneiensis* (B), where normal leaf production is closely clustered along stem or branch segments and alternate with longer internodes bearing reduced or often much shorter leaves. (Photo A by K.M. Wong; B from *Sands et al. 5484* (SAR) by P.K. Hoo).

linear-leaved species enumerated in the present account, which are single-stemmed or with slender stems, and typically forest understorey plants. This species has been recorded in Borneo only on the Semporna Islands off E Sabah, its range mainly from the Philippines to Sulawesi (Wong et al. 1999).

Also, there are differences among the taxa in the inflorescence form, some simple (unbranched) and often not exceeding the terminal cluster of leaves, and others branched and either not exceeding the terminal cluster of leaves or conspicuously topping the terminal leaf cluster. *Dracaena multiflora* also occasionally has inflorescence branching to two orders, whereas so far as known, two-order inflorescence branching in other Bornean species is rare and has only been recorded occasionally in *D. borneensis* and *D. hosei*.

Flower and fruit characteristics have been little explored in the genus, and very poorly represented in Southeast Asian material. Most material had been collected through forestry department excursions that paid relatively less attention to smaller plant forms; fruiting material, their rare size differences not carefully recorded, were often the more attractive to collectors, and flowering material was scanty and did not preserve well under tropical conditions until more recently. Consequently, it was more practical to separate specimen material by the more accessible characteristics, such as leaves and overall inflorescence form.

3.3 | Key to 16 Linear-Leaved *Dracaena* Species in Borneo

1. Plants of highly exposed environments, typically multi-stemmed; trunk massive (reaching 5–10 cm or thicker) with inflorescence rachises bearing branches in close clusters at the lower part and sometimes branched to two orders. [Semporna Islands off E Sabah] ..... ***D. multiflora*** Warb. ex P.Sarasin & Sarasin

1. Plants of forest understorey environments, typically solitary-stemmed; stems slender (mostly barely 5 cm at most) with inflorescence unbranched or bearing well-spaced solitary branches throughout. [Main Borneo Island or off west coast],

2. Leaf bases with abruptly infolded sides ("pinched") and appearing much narrowed just above the very base ..... ***D. hosei*** (Ridl.) Jankalski

2. Leaf bases gradually narrowed, either only slightly compared to the mid-blade (the leaf base then broadly laminate), or extremely narrowed with less than 30% the width of the mid-blade or hardly any lamina on both sides of the midrib (the leaf base then forming a "pseudo-petiole"),

3. Leaf base broadly laminate,

4. Leaves 1.5–4 mm wide only..... ***D. kerangasensis***

4. Leaves 6–25(–30) mm wide,

5. Inflorescence unbranched or with 1–2 (rarely with 5) short basal branches; perianth 26–28 mm long, including 15–17 mm long lobes; leaves (6–)10–17 mm wide ..... ***D. sylvatica*** [only known from Brunei (Temburong) and Sarawak (Ulu Sarikei) on shale-derived substrate; possibly also Sabah]

5. Inflorescence with several conspicuous branches along its length; perianth 17.5–22 mm long, including 7–11 mm long lobes,



FIGURE 5 | The earliest collection of *Dracaena multiflora* in Borneo by Keith in 1938 (SING). (Image copyright Singapore Botanic Gardens).

6. Leaves broader (8–)15–25(–30) mm wide, mostly 40 cm long or much more [mostly sandy clay and other substrates: widespread all over Borneo] ..... ***D. borneensis*** (Merr.) Jankalski

6. Leaves only 6–8 mm wide, (10–)25–30 cm long [ultramafic substrates: Sabah] ..... ***D. pereirae***

3. Leaf base pseudo-petiolate,

7. Inflorescence unbranched or with 1–2(–4) short inconspicuous lateral branches,

8. Vegetative growth is episodic, where normal leaf production along stems or branches alternates with a series of internodes bearing reduced or often much shorter leaves,

9. Flowers with 20–25 mm long perianth on 14–18 mm long pedicels; pseudo-petiolate part of leaf base only c. 0.5 cm long or less; leaf blade broadest below middle (Sabah) ..... ***D. madanii***

9. Flowers with 15–22 mm long perianth on c. 3.5 mm long pedicels; pseudo-petiolate part of leaf base 2.5–4 cm long or more; leaf blade broadest around the

middle (SW Sarawak: Bako, Pueh, Batang Ai) ..... ***D. kuswatae***

8. Vegetative growth is continuous, where leaves are produced regularly with stem or branch elongation,

10. Pseudo-petiolate part of leaf base only 1–2 cm long,

11. Leaves 6–15 mm at the widest; inflorescence at least 20 cm long, internodes between fascicles up to 13 mm long (Sabah) ..... ***D. rimiae***

11. Leaves 14–22 mm at the widest; inflorescence not more than 5.5 cm long, internodes between fascicles not more than 6 mm long (Sarawak) .... ***D. brookeae***

10. Pseudo-petiolate part of leaf base 2.5–4 cm long,

12. Perianth 16–18 mm long, including 9–10 mm long lobes; flowers with 6–9 mm long pedicels; leaf blades less than 5 mm wide at mid-blade (peat swamp forest) ..... ***D. andersonii***

12. Perianth 10–13 mm long, including 6–7 mm long lobes; flowers with 3–4 mm long pedicels; leaf blades 10–20 mm wide at mid-blade (dry-land vegetation) ..... ***D. bakatensis***

7. Inflorescence conspicuously branched,

13. Leaves 4–6 cm wide (SW Sarawak: ecotone between mangrove and swamp forest or behind sandy beaches) ..... ***D. maritima***

13. Leaves at most 1.8 cm wide (Mantanani Island off Sabah's Kudat Peninsula or elsewhere on main Borneo island),

14. Inflorescence length 4–6.5 cm long, not exceeding subterminal leaves ..... ***D. abanii***

14. Inflorescence length more than 9 cm long, much exceeding that of subterminal leaves,

15. Vegetative growth episodic, where normal leaf production along stems or branches alternates with a series of internodes bearing reduced or often much shorter leaves; inflorescence 26–40 cm long; bracts on the proximal end of inflorescence ovate, 5–9 mm long, c. 1 mm wide; leaves (6–)10–15(−18) mm wide, length: width ratio 12–15(−23) (known only from Brunei's Tutong district) ..... ***D. bruneiensis***

15. Vegetative growth (probably) continuous, where leaves are produced regularly with stem or branch elongation; inflorescence/infructescence to 14–24 cm long; bracts on the proximal end of inflorescence lanceolate, 4–4.8 cm long, c. 5 mm wide; leaves (8–)10–18 mm wide, length: width ratio slightly less than to exceeding 10 (known only from Sabah's Mantanani Island) ..... ***D. insularis***

3.4 | The Species

1. *Dracaena abanii* K.M.Wong, sp. nov.

Type: MALAYSIA. Sabah, Labuk Sugut, W of Bt Timimbang, 1700 ft., 21 September 1984, *Aban & Amin SAN 69309* (holotype: SAN [2 sheets with same acc. no. 069797]).

Resembles *Dracaena borneensis* (Merr.) Jankalski in the conspicuously branched inflorescences, but differs by its episodic (vs. continuous) vegetative growth resulting in longer leaves produced at intervals alternating with reduced bract-like leaves (vs. absence of episodes with reduced bract-like leaves), pseudo-petiolate (vs. broadly laminate) leaf bases, and inflorescences not exceeding the subterminal leaves in length (vs. inflorescences longer than subterminal leaves).

Treelet. Branching mostly away from the base. Branch/stem diameter below inflorescence 1–1.5 mm. Vegetative growth episodic, where normal leaf production alternates with series of internodes bearing reduced or often much shorter leaves. Leaf shape linear, widest at mid-blade, length: width ratio 17–43, 7–17 cm long, 3–4(−5) mm wide, thin and supple, leaf base gradually narrowed to a pseudo-petiolate portion c. 0.5 cm long. Inflorescence 4–6.5 cm long (rachis 2–5 cm long, c. 0.5 mm diameter), with 1–2 lateral branches 1.2–2 cm long; distance from base of the branch to the first fascicle 11–13 mm long; internodes between fascicles up to 13 mm long; bracts not seen. Flowers not seen, (probably) 1 per fascicle. Fruits ellipsoid, 14 × 9 mm, pedicel below the articulation c. 5 mm long, above the articulation c. 3.5 mm long.

Distribution and habitat: Sabah: Labuk Sugut, lowlands at 560 m elevation.

Etymology: After Aban Gibot (1944–2018) from Bundu Tuhan, formerly of the Sabah Forestry Department, who made many herbarium collections distributed from the SAN herbarium

2. *Dracaena andersonii* P.K.Hoo & K.M.Wong, sp. nov. (Figure 6)

Type: MALAYSIA. Sarawak, Saribas, Maludam, 840 chains from coast, 22 November 1963, *Anderson S 19101* (holotype: SAR; isotypes: K [K000401498], L [L.1461788]).

Resembles *Dracaena borneensis* (Merr.) Jankalski except the leaf bases are pseudo-petiolate (vs. broadly laminate) and the leaves are less than 5 mm wide (vs. (8–)15–25(−30) mm wide) at mid-blade.

Treelet less than 0.5 m high. Branch/stem diameter below inflorescence 2–3 mm. Vegetative growth continuous along stems/branches, the long-leaf production not interrupted by episodes of reduced or bract-like leaves, but leaves on axes are typically retained for significant lengths of time. Leaf shape linear, widest at mid-blade, length: width ratio 40–55, 13–25 cm long, less than 5 mm wide, thin and supple, leaf base somewhat gradually narrowed to a pseudo-petiole portion 2.5–4 cm long. Inflorescence 27–50 cm long (rachis 12.5–34 cm long, 0.5–1 mm diameter), with 1–4 lateral branches 1.5–7.2 cm long; distance from base of the branch to the first fascicle 18–33 mm long, internodes between



FIGURE 6 | *Dracaena andersonii*, isotype at L. (Courtesy of Naturalis Biodiversity Center, Netherlands).

fascicles up to 17 mm long; bracts on the proximal end of inflorescence linear, 4–7 cm long, 1.5–3 mm wide. Flowers 1–2 per fascicle; perianth 16–18 mm long in open flowers or buds at advanced stage, including 9–10 mm long lobes; pedicels below the articulation 3–5 mm long, above the articulation 3–4 mm long. Fruits not seen.

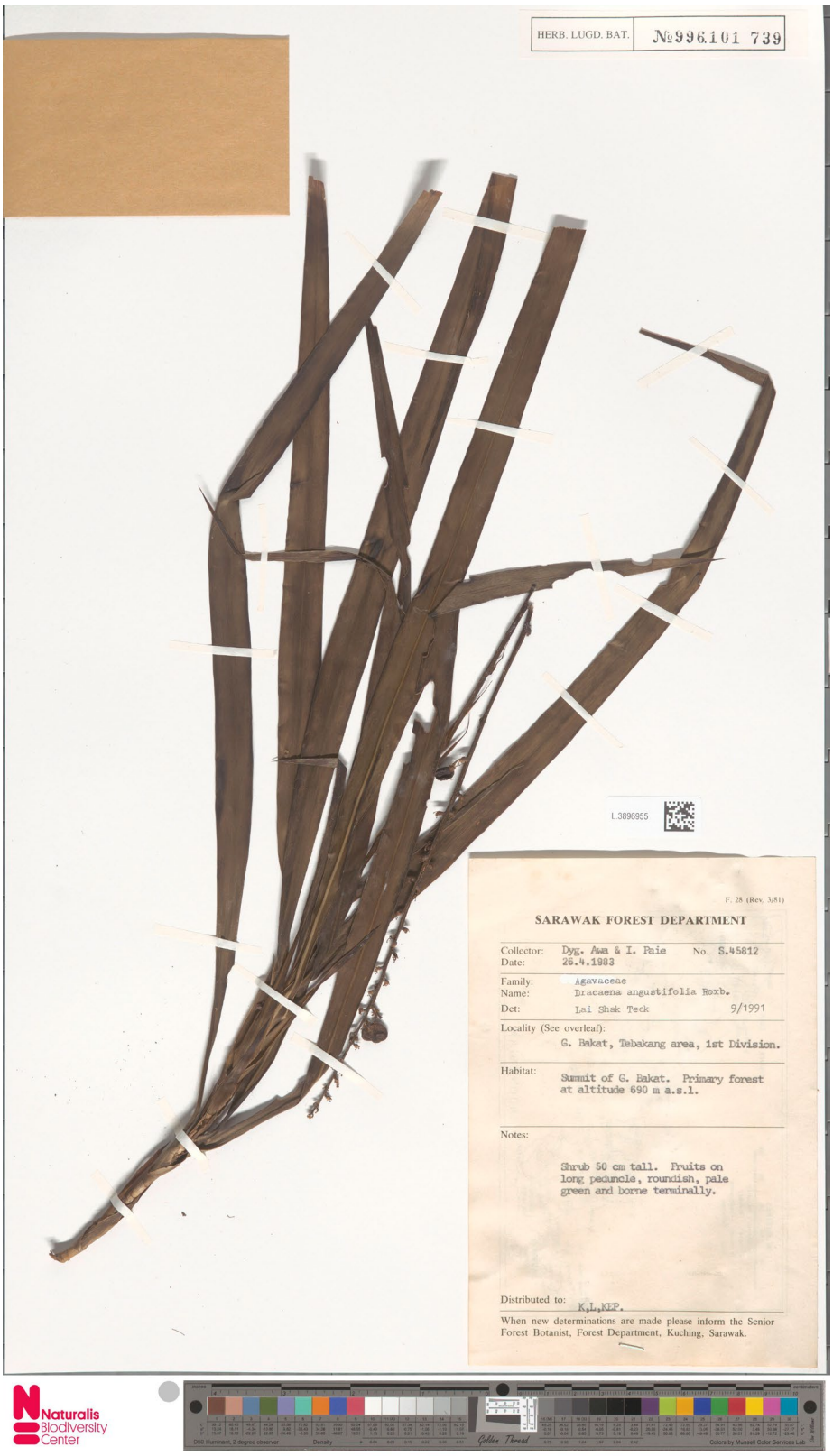

FIGURE 7 | *Dracaena bakatensis*, holotype at L. (Courtesy of Naturalis Biodiversity Center, Netherlands).

Distribution and habitat: Sarawak: rare, documented only from the type collection at the coastal locality of Maludam in SW Sarawak.

Etymology: After J.A.R. Anderson, forest botanist working in Sarawak and Brunei from 1951 to 1970, and specialist on Southeast Asian peatswamp ecosystems.

3. *Dracaena bakatensis* P.K.Hoo & K.M.Wong, sp. nov. (Figure 7)

Type: MALAYSIA. Sarawak, Tebakang area, summit of G Bakat, 690 m, 26 April 1983, *Awa & Paie S 45812* (holotype: L [L.3896955]; isotypes: K [K000401492], KEP, SAR).

Resembles *Dracaena borneensis* (Merr.) Jankalski except the leaves are with 2.5–4 cm long pseudo-petiolate bases (vs. broadly laminate bases) and the inflorescences are unbranched or with 1–2 lateral branches (vs. conspicuously branched).

Treelet c. 0.5 m high. Branch/stem diameter below inflorescence 2–3 mm. Vegetative growth continuous along stems/branches, the long-leaf production not interrupted by episodes of reduced or bract-like leaves, but leaves on axes are typically retained for significant lengths of time. Leaf shape linear, widest at mid-blade, length: width ratio 30–50, 15–25 cm long, 10–20 mm wide, thin and supple, leaf base somewhat gradually narrowed to a pseudo-petiolate portion 2.5–4 cm long. Inflorescence 20.5–42 cm long (rachis 7–29.5 cm long, c. 1 mm diameter), unbranched or with 1–2 lateral branches c. 4.1–8 cm long; distance from base of the branch to the first fascicle 1–2 cm long, internodes between fascicles up to 22 mm long; bracts on the proximal end of inflorescence linear, 3–4.6 cm long, c. 2 mm wide. Flowers 3–4 per fascicle; perianth 10–13 mm long in open flowers or buds at advanced stage, including 6–7 mm long lobes; pedicels below the articulation 2–3 mm long (4–6.5 mm long in fruits), above the articulation c. 1 mm long (1–2 mm long in fruits). Fruits ellipsoid, bilobed or trilobed, 6–12 × 7–14 mm.

Distribution: Sarawak and W Kalimantan: rare

Etymology: After Mt. Bakat in Sarawak, where the type was collected

Additional specimens examined: INDONESIA. West Kalimantan: Kabupaten Sanggau, Ngira, 10 July 1993, *De Jong 413* (BO, L [L.3887445], NY [00194062]). **MALAYSIA: Sarawak**: Belarga [=Belaga], 27 August 1954, *Brooke 9108* (L [L.1461846]); Sematan, Kampong Pueh, 50 ft., 25 September 1955, *Purseglove P 4836* (SING).

4. *Dracaena borneensis* (Merr.) Jankalski, Sansevieria 18 (2008) 20. (Figure 8)

Basionym: *Pleomele borneensis* Merr., J. Straits Branch Roy. Asiat. Soc. 85 (1922) 160. Type: MALAYSIA. British North Borneo, Sandakan and vicinity, September–December 1920, *Ramos 1414* (**lectotype:** US [00091936], here designated; isolectotypes: K [K000292047], L [barcode = L0819875], P [P00440571]).

Synonym: *Pleomele angustifolia* var. *angustior* Ridl., J. Bot. 68 (1930) 178; *Dracaena angustifolia* var. *angustior* (Ridl.) Jankalski, Sansevieria 18 (2008) 20. Type: MALAYSIA. British North Borneo, Sandakan, August 1895, *Creagh s.n.* (K [K000401513]).

A lectotype is required as Merrill did not state at which herbarium the holotype might be. It is likely he might have intended the Philippine National Herbarium before its destruction during the 2nd World War. We designate the US duplicate as lectotype here as Merrill named the species immediately prior to his return to the U.S.A. Jankalski (2008) has also not designated such.

Treelet 2–5 m high to 6–7 m tall, diameter (2–)4–10 cm. Branching usually much above the base. Branch/stem diameter below inflorescence 5–10 mm. Vegetative growth continuous along stems/branches, the long-leaf production not interrupted by episodes of reduced or bract-like leaves, but leaves on axes are typically retained for significant lengths of time. Leaf shape linear, widest at mid-blade, length: width ratio 12–67 or more, mostly 40–48 cm long or much more, (8–)15–25(–30) mm wide, thin and supple, leaf base broadly laminate. Inflorescence (29–)38–65 cm long (rachis to 57 cm long, 1.5–3 mm diameter), conspicuously branched throughout its length, branches (5–)17–32 cm long, occasionally with secondary branches 3–5 cm long; distance from base of the branch to the first fascicle 2–4 cm long, internodes between fascicles up to 20 mm long; bracts on the proximal end of inflorescence lanceolate to linear, (4.6–)7.5–10.8 cm long, 6–8.5 mm wide. Flowers 2–6 (rarely 1) per fascicle; perianth 18–22 mm long in open flowers or buds at advanced stage, including (8–)10–11 mm long lobes; pedicels below the articulation 3.5–6.5 mm long (5–9 mm long in fruits), above the articulation not discernible (not discernible to c. 1 mm long in fruits). Fruits globose to bilobed, 6–7 × 6–12 mm, ripening yellowish orange then reddish brown.

Distribution and habitat: Plants of forest understorey environments. Widespread all over Borneo; lowlands to lower montane forest, mostly sandy clay and other (including ultramafic) substrates.

Etymology: After Borneo island.

Additional specimens examined: BRUNEI. Temburong, Bukit Belalong, south ridge, 20 July 1989, *Wong WKM 1416* (BRUN, K [K000401511], L 2 sheets [L.1460550, L.1460551], SING). **INDONESIA. East Kalimantan:** Malinau, Pujungan, Long Belaka (Sg Lurah), Kayan-Mentarang NP, 200–500 m, 21 September 2002, *Koizumi & Lalo MK 1034* (BO Sheet 1 [acc. no. 1495019], Sheet 2 [acc. no. 1495020]); Long Segar, Long Sei Barang, 23 April 1980, *Soedjito HS 1689*, (BO Sheet 1 [acc. no. 1584464], Sheet 2 [acc. no. 1584465], Sheet 3 [acc. no. 1584466]); PT. ITCI area Balikpapan, 100–200 m, 19 August 1974, *Wiriadinata 287* (BO [acc. no. 1584470]); Wanariset, 2 ½ walk SE of Long Sg Barang, 750 m, 10 May 1993, *Van Valkenburg JVV 1281* (BO [acc. no. 1401151], K [K000401482]). **West Kalimantan:** Pontianak, Bentiang, 1 km NE of Kg Semame, 720 m, 22 October 1980, *Shea 26046* (BO Sheet 1 [acc. no. 1746879], Sheet 2 [acc. no. 1746880], Sheet 3 [acc. no. 1746881]). **MALAYSIA. Sabah:** Beaufort, Beaufort Hill, 10 May 1990, *Ag. Amin SAN 126638* (L 2 sheets [L.3896849], [L.3896850]); Beluran, Trusan Sugut FR, east of Rosecamp, kerangas forest, 16 November 2017, *Sugau SAN 158936* (SAN); Jesselton, S end of Gaya Island FR, 700 ft., 5 August 1954, *Wood SAN A 4513* (A [02656530], KEP, L [L.1449282], MEL, SAN, SING); Keningau, Bt Kitau, 6 September 1982, *Ag. Amin SAN 95309* (K [K000401540], KEP, L [L.1460552], SAN, SAR); Kota Kinabalu, P Gaya SW,

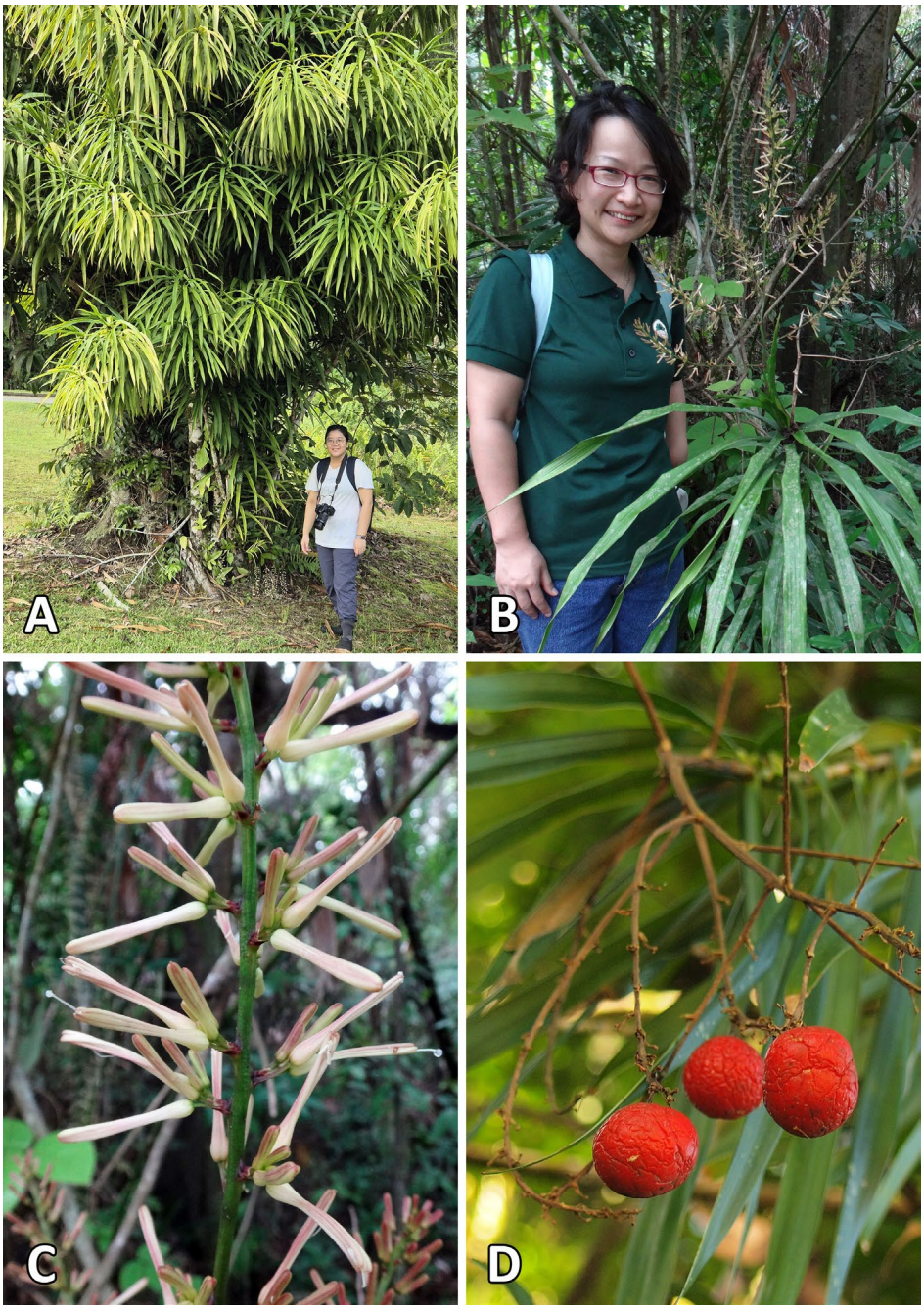

FIGURE 8 | *Dracaena borneensis*. (A) Habit, Sarawak, Borneo Heights. (B) Young plant already flowering, *Wong WKM 3513*, Sabah, Sandakan. (C) Close-up of flowers, *Wong WKM 3513*, Sabah, Sandakan. (D) Ripe fruits, Sabah, Kampung Melangkap. (All photos by K.M. Wong, except (D) by P.K. Hoo).

100 ft., 15 April 1977, *Stone, Anderson & Madani SAN 86837* (SAN); Kota Marudu, on hill ridge above Kg Torintidon, 9 August 1983, *Aban SAN 99551* (K 2 sheets [K000401541], [K000401542], L 2 sheets [L.1460548], [L.1460549], SAN, SAR); Kuala Penyu, Taman-Taman Sabah Pulau Tiga, 20 March 1990, *Ag. Amin SAN 126609* (L [L.3896851], SAN); Kuala Penyu, Taman-Taman Sabah Pulau Tiga, 25 April 1993, *Ag. Amin SAN 127166* (L [L.3893424], SAN, SAR); Kudat, 150 ft., 19 February 1970, *Fox SAN 69401* (SAN); Kudat, Balambangan, 2 March 1970, *Fox SAN 69639* (SAN); Kudat, Bengkoka Peninsula, about 1 mile NE of Kg Bawing, 150 ft., 13 September 1972, *Shea & Minjulu SAN 76127* (A [02225228], K [K000401633], KEP, KLU, L [L.1449158], SAN, SAR, SING); Kudat, Kitobu FR, 4 March 1986, *Joseph & Matin SAN 111583* (SAN [2 sheets]); Kudat, Loroh FR, 400 ft., 15 March 1964, *Ampuria SAN 41347* (K, L [L.1461840], SAN); Kudat, P Balambangan middle W side just E of Tg Panbatu, 10 ft., 12 April 1977, *Stone et al. SAN 86797* (SAN); Lahad Datu, Danum Valley, 8 August 1986, *Aik et al. SAN 111909* (SAN [2 sheets]); Maliau Basin, about 2.5 km upstream from the main falls on the Maliau R on the W of the R, c. 750 m, 12 April 1996, *Maliau Basin Vouchers MBV 83* (SAN); Mt. Kinabalu, Tenompok, top wall of Minitindok, 3000–4000 ft., 10 May 1932, *Clemens & Clemens 29669* (BO [acc. no. 1389349], L [L.1460294]); Papar,

Hutan Simpan Mandahan, 16 August 1990, *Ag. Amin SAN 126214* (E [E00210787], L [L.3715781]); Ranau, about 8 miles E of Kg Merungin, 1000 ft., 18 November 1975, *Leopold & Saikeh SAN 82618* (SAN); Ranau, about 8 miles E of Kg Merungin, 800–1000 ft., 17 November 1975, *Leopold & Saikeh SAN 82604* (SAN); Ranau, Bayaon, 26 July 1989, *Soinin & Suin SAN 129107* (SAN, L [L.3808816]); Ranau, Kg Bundu Tuhan, Tontorogong, Kg Himbaan, 25 March 1993, *Doinis Soibeh 188* (SNP); Ranau, Tompurungon, 17 July 1986, *Ag. Amin & Jairius SAN 115974* (L [L.3896858], SAN [2 sheets]); Ranau, Trusmadi Tambahan 1, 17 July 1985, *Ag. Amin SAN 110416* (SAN [2 sheets]); Sabah, Ranau, Bukit Hampuan FR, 8 September 2020, *Suzana SAN 160958* (SAN); Sandakan, ½ mile SW of Trig Buli Sim-Sim, 350 ft., 8 December 1963, *Pereira WJ SAN 41071* (SAN); Sandakan, Bukit Munyit, Lungmanis, 600 ft., 13 May 1971, *Fox & Charington SAN 64394* (SAN); Sandakan, July 1928, *Arsat 686* (SING, NY); Sandakan, Kabili-Sepilok R.R., Compartment 18, 11 September 1939, *Enggoh SAN 10653* (SING); Sandakan, Kebun Cina FR, 300 ft., 13 August 1963, *Sinanggul SAN 38375* (K, L, SAN); Sandakan, Kertam, Sg Merah, 6 April 1984, *Dewol SAN 55997* (K [K000401545], KEP, L [L.1460553], SAN (2 sheets), SAR); Sandakan, Kg Bakau batu 4, 15 November 1994, *Postar & Serimun SAN 141250* (SAN); Sandakan, Leila FR, 200 ft., 14 December 1967, *Binson, Aban & James SAN 62120* (K [K000401863], SAN); Sandakan, Leila FR, 25 February 1975, *Kodoh & Patrick SAN 81327* (SAN); Sandakan, Leila FR, 85 ft., 6 September 1963, *Sayu SAN 38896* (K [K000401857], L [L.1461841], SAN); Sandakan, Leila FR, at roadside to TV station, 500 m, 15 September 1987, Meijer *SAN 122311* (SAN [2 sheets]); Sandakan, Mile 17 Labuk road, 26 March 1963, *Mukmin Amir SAN 35623* (SAN); Sandakan, near cemetery, 12 May 1935, *Keith N Borneo Forestry Dept 3980* (L [L.1460507], SING); Sandakan, near Leila Forest Reserve, 350 ft. 11 July 1961, *Patrick SAN* 26383 (L [L.1449340], SING); Sandakan, Sepilok FR, 20 March 1950, *Kadir SAN A 2744* (SAN, SING); Sandakan, Sepilok FR, Cpt 13, 18 December 1947, *John SAN A 665* (SAN, SING); Sandakan, Sepilok, Sg Kabili, 26 September 1985, *Dewol et al. SAN 111210* (SAN); Sandakan, Tangkulap FR, 3 December 1985, *Ag. Amin & Kumin SAN 111660* (SAN [2 sheets]); Sipitang, Malalia FR, 18 March 1981, *Marsal & Heya SAN 86207* (L [L.3886581], SAN); Telupid, Bt Tawai FR, logging road near first waterfall, 5°30′ N, 117°05′ E, 365 m, 7 April 1994, *Mat-Salleh et al. KMS 3301* (SAN); Telupid, Tawai FR, 390 m, ultramafic, 3 March 2016, *Jeisin SAN 158061* (SAN, SING); Tongod, Sg Imbak, 26 August 1992, *Madani SAN 133980* (SAN). **Sarawak**: Baram, Miri River, January 1895, *Hose 542* (K [K000401485]); Batang Balleh, Bt Melatai, Sg Melatai, 1050 m, 27 April 1985, *Yii et al. S 48575* (K, KEP, L [L.3808919], SAR); Ba′ Kelalan, Marudi, Pulong Tau NP, along roadside at Long Ubau, 4°03′19′′ N, 115°36′19′′ E, 947 m, 13 September 2006, *Jacqualine & Shalih S 90238* (SAR); Bt Mersing, 3040 m, 12 November 1974, *Laijanai S 35956* (K, KEP, L [L.1460544], MO [4018348], SAN, SAR); Kapit, Upper Rajang R, 1929, *Clemens & Clemens 2104* (SAR); Miri, Lambir NP, 150 m, 5 November 1983, *Abang Mohtar S 47252* (K [K000401493], KEP, L, MO, SAN, SAR); Mulu National Park, Sg Terikan near G. Binarat, 30 April 1985, *Abang Mohtar et al. S 49500* (L [L.3886668]).

5. *Dracaena brookeae* K.M.Wong, sp. nov. (Figure 9)

Type: MALAYSIA. Sarawak, Simanggang, 31 October 1955, *Brooke 10819* (holotype: L [L.1461845])

Resembling *Dracaena borneensis* (Merr.) Jankalski except the leaf bases are pseudo-petiolate (vs. broadly laminate) and the inflorescence is unbranched (vs. conspicuously branched) and not longer than 5.5 cm (vs. much longer), much shorter (vs. as long as or longer) than leaves in the terminal cluster.

Treelet. Branch/stem diameter below inflorescence 2–3 mm. Vegetative growth continuous along stems/branches, the long-leaf production not interrupted by episodes of reduced or bract-like leaves, but leaves on axes are typically retained for significant lengths of time. Leaf shape linear, widest at mid-blade, length: width ratio 12–15, 20–28 cm long, 14–19 mm wide, thin and supple, leaf base somewhat gradually narrowed to a pseudo-petiolate portion 1–2 cm long. Inflorescence 4–5.5 cm long (rachis 2–3.5 cm long, c. 2–3 mm diameter), unbranched; internodes between fascicles up to 6 mm long; bracts on the proximal end of inflorescence linear, c. 15 mm long, c. 1 mm wide. Flowers 1–3 per fascicle; perianth 21–23 mm long in open flowers or buds at advanced stage, including 1.1–1.2 mm long lobes; pedicels below the articulation 3–4 mm long, above the articulation not discernible. Fruits not seen.

Distribution: Sarawak: rare, known only from one locality.

Etymology: After Winifred M.A. Brooke who made collections in Sarawak 1954–1955.

Additional specimen examined: SARAWAK. Simanggang, 27 October 1955, *Brooke 10712* (US [03966313]).

6. *Dracaena bruneiensis* K.M.Wong, sp. nov. (Figure 10)

Type: BRUNEI. Belait, Labi, Bt Teraja, ridge south of the summit, 4°18′ N, 114°26′ E, 390 m, 20 March 1991, *Sands, Johns, Awong & Shanang 5484* (holotype: BRUN; isotypes: K [K000401503], L [L.3886597], SAN, SAR).

Resembling *Dracaena borneensis* (Merr.) Jankalski in its conspicuously branching inflorescence that much exceeds the subterminal leaves in length except vegetative growth is episodic (vs. continuous), resulting in longer leaves produced at intervals alternating with reduced bract-like leaves (vs. absence of episodes with reduced bract-like leaves) and leaf bases are pseudo-petiolate (vs. broadly laminate).

Treelet c. 3 m tall. Branching mostly away from the base. Branch/stem diameter below inflorescence 2–3 mm. Vegetative growth episodic, where normal leaf production along stems or branches alternates with series of internodes bearing reduced or often much shorter leaves. Leaf shape sublinear, widest at mid-blade, length: width ratio 12–15(−23), (18–)25–31 cm long, (6–)10–15(−18) mm wide, thin and supple, leaf base abruptly narrowed to a pseudo-petiolate portion 1–3 cm long. Inflorescence 26–40 cm long (rachis 15–28 cm long, 1–2 mm



FIGURE 9 | *Dracaena brookeae*, holotype at L. (Courtesy of Naturalis Biodiversity Center, Netherlands).

diameter), conspicuously branched throughout its length, branches (3–)6–12 cm long; distance from base of the branch to the first fascicle 10–20 mm long, internodes between fascicles up to 14 mm long; bracts on the proximal end of inflorescence ovate, 5–9 mm long, c. 1 mm wide. Flowers 1 (rarely 2) per fascicle; perianth 11–12 mm long in buds, including 5.5–7 mm long

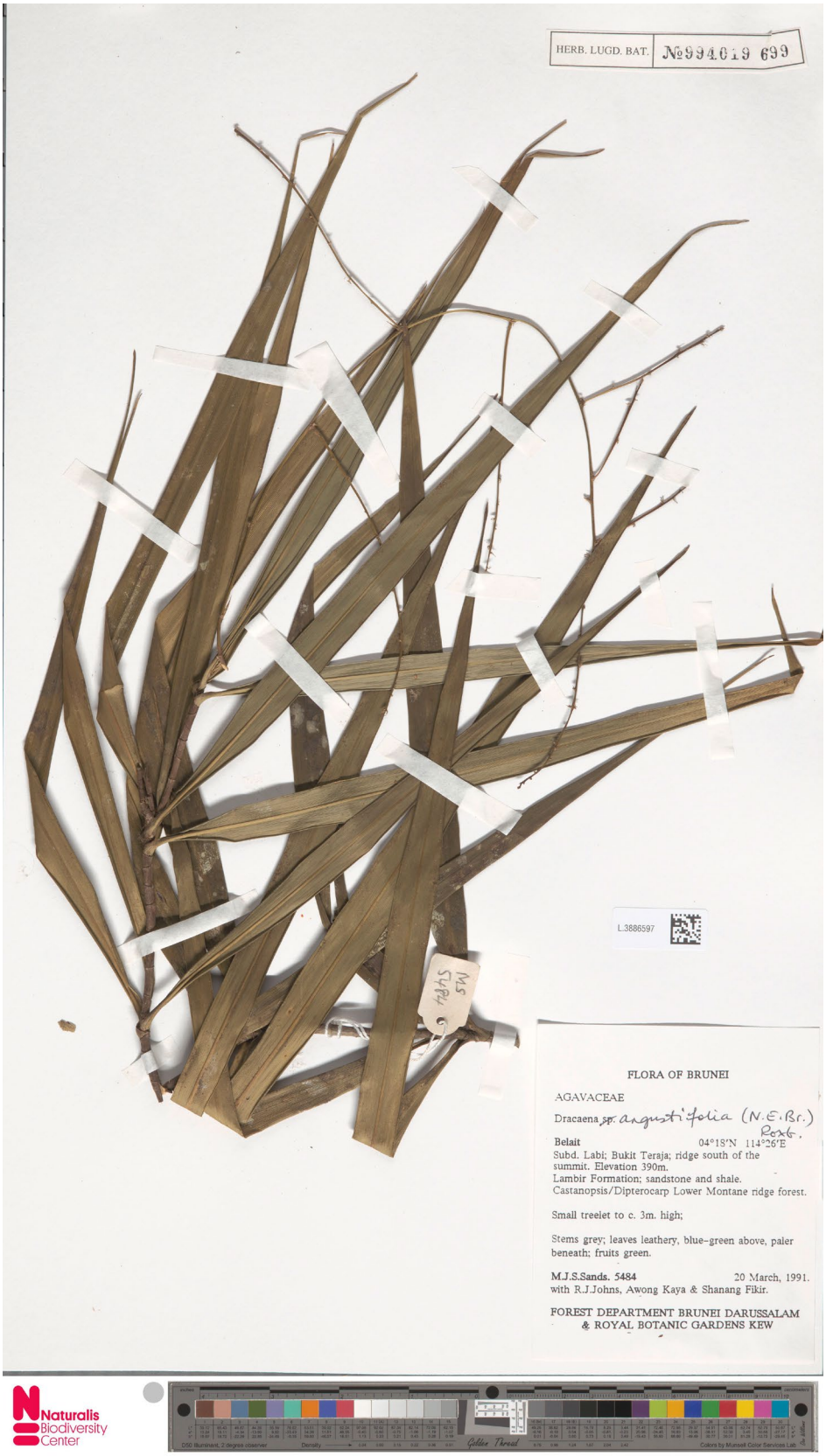

FIGURE 10 | *Dracaena bruneiensis*, isotype at L (Courtesy of Naturalis Biodiversity Center, Netherlands).

lobes; pedicels below the articulation 2.5–3 mm long (c. 4 mm long in fruits), above the articulation c. 1 mm long (c. 6.5 mm long in fruits). Fruits ellipsoid, c. 11 × 7 mm.

Distribution: Brunei: rare, known only from two gatherings.

Etymology: After Brunei Darussalam.



FIGURE 11 | *Dracaena hosei*. *Francis SAN 109623* (Courtesy of Naturalis Biodiversity Center, Netherlands).

Additional specimen examined: BRUNEI. Tutong, August 1958, *Brunig S 17488* (SAR).

7. *Dracaena hosei* (Ridl.) Jankalski, Sansevieria 18 (2008) 20. (Figure 11)

Basionym: *Pleomele hosei* Ridl., J. Bot. 68 (1930) 180. Type: MALAYSIA. Sarawak, Baram, Miri River, January 1895, *Hose 527* (**lectotype:** K [K000292045], here designated; isolectotypes: BM [BM000799611], E [E00191025]).

Ridley (1930) had not specified which herbarium might have the main type sheet, neither did Jankalski (2008); here the K specimen is elected lectotype.

Treelet usually 1.5–6 m tall, sometimes recorded as up to 13–20 m high with trunk of 12–30 cm diameter. Branching usually much above the base. Branch/stem diameter below inflorescence 4–5 mm. Vegetative growth continuous along stems/branches, the long-leaf production not interrupted by episodes of reduced or bract-like leaves, but leaves on axes are typically retained for significant lengths of time. Leaf shape linear, widest at mid-blade; length: width ratio 10–20 or slightly more, (11–)17–30 cm long or more, 10–15(–20) mm wide; thin and supple, leaf base with abruptly infolded sides ("pinched") and appearing much narrowed just above the very base. Inflorescence 17–36 cm long (rachis 15–36 cm long, 1.5–2 mm diameter), conspicuously branched throughout its length, branches (5–)10–21 cm long, occasionally with secondary branches 2.2–4.1 cm long; distance from base of the branch to the first fascicle 1.3–4 cm long, internodes between fascicles up to 2.7 cm long; bracts on the proximal end of inflorescence lanceolate, 1.7–6.3 cm long, 4–6.5 mm wide. Flowers 2–5 per fascicle; perianth 23–25 mm long in open flowers or buds at advanced stage, including 11–13 mm long lobes; pedicels below the articulation 2–2.5 mm long (7–10 mm long in fruits), above the articulation c. 2 mm long (2–6 mm long in fruits). Fruits globose to elliptic to 2–3-lobed, 8–20 × 8–25 mm.

Distribution and habitat: Quite common in Borneo. Plants of forest understorey environments, on all substrates including ultramafics.

Etymology: After Charles Hose (1863–1929), sometime district officer of Baram in Sarawak.

Additional specimens examined: BRUNEI. Belait, Labi, Jalan Kecil Ratan, 24 December 1994, *Salleh Ismail et al. BRUN 16275* (BRUN, K [K000401508], SING). **INDONESIA. Central Kalimantan:** Katingan R, Sg Rasau, 16 March 2007, *Wita Wardani & Amir WT 583* (BO). **West Kalimantan:** 2 m, 22 August 1930, *Fryd, Boschbouwproefstation b.b. 14427* (L [L.1462450], BO); Pontianak, Mampawah 6 m, 28 September 1948, *Enoh 380* (A [02656449], BO, K, L [L.1462441]). **MALAYSIA. Sabah:** Beaufort, Melalap, Melutut, 20 December 1968, *N. Binideh SAN 65194* (K [K000401860], L [L.1449163], SAN); Keningau, Apin-Apin, path to Laing Cave, 2000 ft., 2 August 1965, *Lajangah SAN 44552* (K [K000401861], L [L.1449201], SAN, SAR); Keningau, Crocker Range FR, 2500 ft., 17 November 1976, *Dewol SAN 84026* (K [K000401869], KEP, L [L.1461793], SAN, SAR, SING); Keningau, Mile 9 Keningau–Kimanis road, 1 October 1981, *Aban, Meijer & Dewol SAN 94103* (K [K000401539], KEP, L [L.1460545], SAN, SAR); Keningau, Nabawan, Tiulon, 10 September 1976, *Tarmiji & Dewol SAN 83894* (K [K000401535], KEP, L, SAN, SAR, SING); Keningau, Sook Plain FR, 17 June 1976, *Dewol SAN 80770* (K [K000401557], KEP, L [L.1460558], SAN, SAR, SING); Keningau, Ulu Biah, 1000 ft., 11 October 1976, *Dewol SAN 83916* (A [02656463], K [K000401536], KEP, L [L.1460564], OXF, SAN, SAR, SING); Kota Belud, Mile 19 along Sg Kadamaian, 1500 ft., 12 February 1966, *Kanis & Kuripin SAN 56101* (A [02656444], KEP, SAN [2 sheets], US [03966252]); Kota Marudu, Kinabalu Park, Serinsim, around staff quarters, 400 m, 2 November 1993, *Nais et al. SNP 05534* (SAN, SNP); Lahad Datu, base of Mt. Silam, 80 ft., 18 March 1972, *Anon. SAN 75139* (SAN); Lahad Datu, Danum Valley, Ulu Segama, 7 July 1985, *Kembira Loloh SAN 109664* (SAN [2 sheets], SAR); Lahad Datu, Silam, 100 ft., 30 January 1963, *Hepburn SAN 37180* (SAN); Lahad Datu, Ulu Sg Danum, S of Camp 3, 2 September 1976, *Stone et al. SAN 85268* (SAN); Lamag, Karamuak, Bintang Mas logging area, 25 August 1975, *Tarmiji SAN 81640* (SAN); Lamag, Karamuak, Bintang Mas logging area, 25 August 1975, *Tarmiji SAN 81637* (SAN); Mostyn, Ulu Kalumpang FR, 21 November 1968, *Bongsu SAN 64656* (K [K000401859], L [L.1449164], SAN, SAR, SING); Mt. Kinabalu, Dallas, 3000 ft., 1 December 1931, *Clemens & Clemens 27306* (BO); Mt. Kinabalu, E shoulder, Sg Lohan, 6°5′ N, 116°26–40′ E, 1500 ft., 11 September 1961, *Chew, Corner & Stainton RSNB 2964* (BO, K [K000401859], L [L.1460509], SAN, SAR, SING); Pinatassen, 14 March 1929, *Evangelista 868* (SING); Ranau, Bt Hampuon, 2600 ft., 9 May 1960, *Meijer SAN 20978 [Abbe 9962]* (SAN, L [L.1460508]); Ranau, Kg Lobou, 17 June 1985, *Sigin et al. SAN 109349* (L [L.1460554], SAN [2 sheets]); Ranau, Kinopulidan, 14 July 1986, *Amin et al. SAN 116019* (L [L.3896873], SAN [2 sheets]); Ranau, Mamut, 9 September 1987, *Amin & Francis SAN 121088* (L [L.3807837], SAN [2 sheets]); Ranau, Nalumad, park boundary, 620 m, 10 July 1991, *Alim Biun SNP 3765* (SAN, SNP); Ranau, near Kg Pinawantai, 1500 ft., 5 May 1973, *Shea & Aban SAN 76771* (K [K000401531], KEP, L [L.1460562], SAN, SAR, SING); Ranau, Segindai, 300 m, 13 August 1983, *Amin & Dewol SAN 99325* (L [L.3896857], SAN [2 sheets], SAR); Ranau, Ulu Tungud FR, G Monkobo, Sg Parangampang, 5°49′56″ N, 116°59′28″ E, 437 m, 29 July 2005, *Saw et al. SAN 145966* (A, K [K000203788], KEP, L [L.3886843], SAN, SAR); Sandakan, Meliau R, 1 ½ miles from Kuala Labuk above Kiabau, 50 ft., 13 May 1965, *Meijer SAN 50049* (K, L [L.1460506], SAN, SAR, HAW, SING); Sandakan, road to Lamag, 18 July 1973, *Bongsu SAN 78515* (A [02656450], K [K000401532], KEP, L [L.1460563], SAN, SAR, SING); Sandakan, Telupid, along Meliau R, 10 October 1968, *Madani SAN 63524* (K [K000401864], SAN); Semporna, Timbun Mata F.R., 30 ft., 20 August 1938, *Agama & Valera 9893* (SING); Sipadan Island, forest along trail from NW of island to E side through the center, 13 October 1993, *Wong, Berhaman & Suin WKM 2494A* (E [E00674367], K [K000401570], KEP, L [L.3896519], SAN, SAR); Telupid, Labuk & Sugut, foot of Mt. Tawai, along Sg Meliau, c. 100 m, 22 October 1968, *Kokawa & Hotta 270* (SAN); Telupid, Tawai FR, 18 October 1985, *Francis Augustine SAN 109623* (A, K [K000401553], KEP, L [L.3886566], SAN [2 sheets], SAR, SING); Tenom, 15 km N of Tenom, around Kg Malulut, 450 m, 20 December 1968, *Kokawa & Hotta 2315* (SAN); Tenom, Melalap, Crocker Range FR, 1600 ft., 16 November 1968, *Pitty & Ogata SAN 63273* (SAN); Tenom, Melalap, Ulu Sg Oloson, Melutut FR, 17 April 1985, *Fidilis & Sumbing SAN 96327* (SAN [2 sheets], SAR); Tenom, Tenom area, 24 July 1968, *Pitty Binideh SAN 55831* (KEP, SAN, SAR); Tenom, Tomani, 90 ft., 24 April 1968, *N. Binideh SAN 55707* (SAN); Tenom, Ulu Temani, on Murut Trail,

1300 ft., 1 April 1965, *Francis Sadau SAN 49494* (SAN). **Sarawak:** Baram, Kelabit Highlands, Arul Linalang near foot of Apo Duat, 1180 m asl., 13 November 1974, *Chai S 35525* (A [02656443], K [K000401491], L [L.1460556], MO [2417522], SAN); Kuching, 1929, *Clemens & Clemens s.n* (SAR); Kuching, 1929, *Clemens & Clemens 20836* (BO); Gat, Upper Rejang R, 1929, *Clemens & Clemens 21894* (BO); Gat, Upper Rejang R, Mt. Matang, 29 Oct 1929, *Clemens & Clemens 21895* (SAR).

8. *Dracaena insularis* K.M.Wong, sp. nov.

Type: MALAYSIA. Sabah, Kota Belud, Mantanani Island, 5 ft., 10 May 1963, *Lajangah SAN 36105* (holotype: SAN; isotype: L [L.1461852]).

Resembling *Dracaena borneensis* (Merr.) Jankalski in its continuous vegetative growth and conspicuously branching inflorescence except for the pseudo-petiolate (vs. broadly laminate) leaf bases, 9–18 cm long (vs. mostly 40–48 cm long) leaves and 14–24 cm long (vs. (29–)38–65 cm long) inflorescence.

Treelet 3–4.5 m tall, stem about 3.5 cm diameter. Branching mostly away from the base. Branch/stem diameter below inflorescence 3–4 mm. Vegetative growth (probably) continuous along stems/branches, the long-leaf production not interrupted by episodes of reduced or bract-like leaves, but leaves on axes are typically retained for significant lengths of time. Leaf shape sublinear, widest at mid-blade, length: width ratio slightly less than to exceeding 10, 9–18 cm long, (8–)10–18 mm wide, thin and supple, leaf base abruptly narrowed to a pseudo-petiolate portion 0.5–1.5 cm long. Inflorescence 14–24 cm long (rachis 11–22 cm long, 1.5–2 mm diameter), conspicuously branched throughout its length, branches 2.5–10 cm long; distance from base of the branch to the first fascicle 15–33 mm long, internodes between fascicles up to 12 mm long; bracts on the proximal end of inflorescence lanceolate, 4–4.8 cm long, c. 5 mm wide. Flowers 1–3 per fascicle; perianth 11–12.5 mm long in buds, including c. 5 mm long lobes; pedicels below the articulation 1.5–2.5 mm long, above the articulation not discernible. Fruits not seen.

Distribution: Known only from Sabah's Mantanani Island.

Etymology: Latin: *insularis*, of an island.

9. *Dracaena kerangasensis* P.K.Hoo & K.M.Wong, sp. nov. (Figure 12)

Type: BRUNEI. Belait, Labi, Bt Teraja, ridge top leading to summit, 4°18′ N, 114°26′ E, 350 m, 11 November 1990, *Dransfield et al. JD 6862* (holotype: BRUN; isotypes: A [02656474], K [K000401499], L [L.3807919], SAN, SAR, SING).

Resembling *Dracaena hosei* (Ridl.) Jankalski except for having leaves that are only 1.5–4 mm wide (not wider) with the leaf bases broadly laminate (not abruptly infolded on both sides).

Treelet or shrubby plant 1.5–3(–7) m tall. Branching mostly much above the base. Branch/stem diameter below inflorescence 3–5 mm. Vegetative growth continuous along stems/branches, the long-leaf production not interrupted by episodes of reduced or bract-like leaves, but leaves on axes are typically retained for significant lengths of time. Leaf shape linear, widest at mid-blade; length: width ratio 65–100 or more, to 40 cm long, 1.5–4 mm wide only; thin and supple, leaf base broadly laminate. Inflorescence 11–33 cm long (rachis 3.5–15(–24) cm long, 0.5–2 mm diameter), unbranched or with 1–2 (rarely 8) lateral branches up to 7.3 cm long; distance from base of the branch to



FIGURE 12 | *Dracaena kerangasensis*. (A) *Niga 296* (SING). (B) Close-up of inflorescence from *Dransfield et al. JD 6862*, isotype at SAR; scale in mm. (Photos: K.M. Wong).

the first fascicle 2–24 mm long, internodes between fascicles up to 28 mm long; bracts on the proximal end of inflorescence linear, 3.5–6.5(−12.5) cm long, 1–2 mm wide. Flowers 1–3 per fascicle; perianth 18–22 mm long in open flowers or buds at advanced stage, including 8–11 mm long lobes; pedicels below the articulation 4–5(−7) mm long (6–8(−12) mm long in fruits), above articulation not discernible (similarly so in fruit). Fruits globose to bilobed, 8–12 × 9–16 mm.

Distribution and habitat: Plants of forest understorey environments. Brunei (Teraja area and Andulau forest); Sarawak (Lawas and SW Sarawak) on sandy kerangas substrates and very rarely in mixed dipterocarp forest.

Etymology: *kerangas*, an Iban word that literally means a site where rice will not grow, representing infertile sandy or podsolic substrates.

Additional specimens examined: BRUNEI. Belait, Andulau F.R., Compartment 5, Ex Situ Sungai Lumut, near river bank, 6 March 2003, *Jangarun BRUN 20211* (SING, BRUN); Belait, Labi, Bt Teraja, 12 November 1995, *Chin & Joffre et al. SING 4618* (BRUN, SAR, SING); Belait, Labi, Bt Teraja, ridge, 15 August 1991, *Niga NN 296* (BRUN, K [000401506], L [L.3886716], SAN, SING [SING0390857]); Belait, Labi, Bt Teraja, valley and ridge to the north of hill rest-shelter, 4°18′ N, 114°26′ E, 285 m, 19 March 1991, *Sands et al. 5474* (BRUN, K [K000401502], L [L.3886601], SAN, SAR); Bukit Teraja, sandstone, 150 m, 5 July 1995, *Salleh et al. BRUN 16854* (BRUN, K [K000401509], L [L.3809070], SAN, SING). **MALAYSIA. Sarawak:** Bt Merayong, 2 ½ hours upstream from Lundu, 50 ft., 18 November 1963, *Pennington 7991* (OXF, SAR); Kuching, near Batang Kayan, Sampadi FR, G Meroyang, 18 August 1960, *Sinclair & Kadim SFN 10407* (A [02656584], B [B100184026], BO, E [E00191029], FI, K [K000401823], L [L.1449202], SAR, SING); Lawas, Bumbong Rumah, 3000 ft., 25 May 1958, *Brunig S 12370* (SAR).

10. *Dracaena kuswatae* K.M.Wong, sp. nov. (Figure 13)

Type: MALAYSIA. Sarawak, Bako NP, 6 July 1963, *Kuswata s.n.* (holotype: BO [acc. no. 1603969]).

Resembling *Dracaena borneensis* (Merr.) Jankalski except for episodic (vs. continuous) growth resulting in longer leaves produced at intervals alternating with reduced bract-like leaves (vs. absence of episodes with reduced bract-like leaves), pseudo-petiolate (vs. broadly laminate) leaf bases, inflorescence unbranched (vs. conspicuously branched along the length).

Treelet 0.3–2 m high, unbranched or sparingly branched; flowering already at some 30 cm high. Branch/stem diameter below inflorescence 2–4 mm. Vegetative growth episodic, where normal leaf production along stems or branches alternates with series of internodes bearing reduced or often much shorter leaves. Leaf shape linear, widest at mid-blade, length: width ratio (5.7–)7.5–11.5(−28), (9–)11–20(−33) cm long, (7–)18–20 mm wide, thin and supple, leaf base gradually narrowed to a pseudo-petiolate portion 2.5–4 cm long or slightly longer. Inflorescence 18–32 cm long (rachis 5.5–15 cm long, c. 1 mm diameter), unbranched; internodes between fascicles up to 16 mm long. Flowers c. 3 per fascicle; perianth 15–22 mm long in open flowers or buds at advanced stage, including 5–8 mm long lobes; pedicels below the articulation c. 2.5 mm long (5–6 mm long in fruits), above the articulation c. 1 mm long (c. 1–2 mm long in fruits). Fruits bilobed, 9–11 mm long, 13–15 mm wide.

Distribution: Sarawak: southwestern part at Bako, Pueh and Batang Ai.



FIGURE 13 | *Dracaena kuswatae*. (A) Holotype at BO. (B) Episodic stem and leaf development, *Nur Safinas et al. S 103843* at SAR; scale in mm. (Photos: K.M. Wong).



FIGURE 14 | *Dracaena madanii*, isotype at L. (Courtesy of Naturalis Biodiversity Center, Netherlands).

Etymology: After Kuswata Kartawinata (1936–2024), Indonesian botanist and ecologist, sometime Keeper of the Herbarium Bogoriense (1978–1984), later Senior Programme Officer with the John D. & Catherine T. MacArthur Foundation and associate of the Field Museum, Chicago; also many international affiliations.

Additional specimens examined: MALAYSIA. Sarawak: Lubok Antu, Batang Ai NP, LEWS, Nanga Talangon, 1°23′728″ N, 112°05′338″ E [correct coordinates likely 1°23.728′ N, 112°05.338′ E], 290 m, 17 March 2000, *Rantai Jawa et al. S 84195* (SAR, KEP); Lubok Antu, Batang Ai NP, LEWS, Ulu Sg Lubang Baya, Sg Talangon area, 290 m, 15 March 2000, *Rantai Jawa et al. S 84163* (SAR); Sematan, Pueh, Sg Cabang, 1°49′34″ N, 109°41′15″ E, 72 m, 26 February 2014, *Nur Safinas et al. S 103843* (SAR).

11. *Dracaena madanii* K.M.Wong, sp. nov. (Figure 14)

Type: MALAYSIA. Sabah, Penampang, path from Kpg. Babagon to Ulu Terian, 2000 ft., 17 October 1969, *Cockburn SAN 66039* (holotype: SAN; isotypes: K [K000401530], L [L.1462435]).

Resembles *Dracaena kuswatae* K.M.Wong except for leaf blades being broadest below the middle (instead of at the middle) and flowers with 14–18 mm long (vs. c. 3.5 mm long) pedicels.

Treelet, height not recorded. Branching away from the base. Branch/stem diameter below inflorescence c. 1–1.5 mm. Vegetative growth episodic, where normal leaf production along stems or branches alternates with series of internodes bearing reduced or often much shorter leaves. Leaf shape lanceolate, widest below mid-blade, length: width ratio (9.6–)10–14, 9–12 cm long, 7–13 mm wide, thin and supple, leaf base with a pseudo-petiolate portion only c. 0.5 cm long or less. Inflorescence 5.5–20 cm long (rachis very fine, 2–6.5 cm long, c. 0.5–1 mm diameter), unbranched or with up to 2 lateral branches 2.5–3 cm long; distance from base of the branch to the first fascicle 2–2.4 cm long, internodes between fascicles up to 22 mm



FIGURE 15 | *Dracaena maritima*, holo at SAR. (Photo: K.M. Wong).

apart; bracts on the proximal end of inflorescence ovate to lanceolate, 3.5–9 mm long, 1–1.5 mm wide. Flowers 1 per fascicle; perianth 20–25 mm long in open flowers or buds at advanced stage, including 5–6 mm long lobes; pedicels below the articulation 7–10 mm long, above the articulation 7–8 mm long. Fruits not known.

Distribution and habitat: Sabah: known only from the type collection on the west coast, as well as from Gunung Nicola, an ultramafic peak on Sabah's eastern flank.

Etymology: After Leopold Madani (1938–2012), Senior Research Assistant and very excellent field botanist at the Forest Research Centre, Sepilok, Sandakan, Sabah until 1998.

Additional specimen examined: MALAYSIA: Sabah: Lahad Datu, Danum Valley, Gunung Nicola, 900 m, 24 February 1992, *Kulip & Madani SAN 133253* (SAN).

12. *Dracaena maritima* P.K.Hoo & K.M.Wong, sp. nov. (Figure 15)

Type: MALAYSIA. Sarawak, Kuching, Samariang, 7th Mile, 8 June 1976, *Banyeng S 37198* (holotype: SAR; isotypes: K [K000401627], KEP, L [L.1449193], MO [2776534]).

Resembling *Dracaena borneensis* (Merr.) Jankalski in its conspicuously branched inflorescence, except for its pseudopetiolate (vs. broadly laminate) leaf bases and 4–6 cm wide (not narrower) leaf blades.

Treelet to 2 m tall. Little-branched, apparently away from the base. Branch/stem diameter below inflorescence 8–10 mm. Vegetative growth continuous along stems/branches, the long-leaf production not interrupted by episodes of reduced or bract-like leaves, but leaves on axes are typically retained for significant lengths of time. Leaves strap-shaped, widest at mid-blade, length: width ratio 12–14, 68–72 cm long, 4–6 cm wide, thick and supple, leaf base gradually narrowed to a pseudopetiolate portion 4–6 cm long. Inflorescence 48–72 cm long (rachis 40 to 63 cm long, 7–10 mm diameter), conspicuously branched throughout its length, branches 14–19 cm long; distance from base of the branch to the first fascicle 4–7.8 cm long, internodes between fascicles up to 21 mm long; bracts on the proximal end of inflorescence ovate to lanceolate, 7.9–12 cm long, 1.6–4 cm wide. Flowers 2–4 per fascicle; perianth not seen; pedicels below the articulation 3–5 mm long (6–12 mm long in fruits), above the articulation c. 1.5 mm long (2–4 mm long in fruits). Fruits globose to bilobed, 10–16 mm long, 10–18 mm diameter.

Distribution and habitat: SW Sarawak and Brunei: ecotone between mangrove and swamp forest or behind sandy beaches.

Etymology: Latin: *maritimus*, near the sea.

Additional specimens examined: BRUNEI. Berakas FR, 50 ft., 9 June 1957, *Ashton BRUN 72* (BRUN, L [L.1461800], SAR [2 sheets]). **MALAYSIA. Sarawak:** Datu PF, 18 May 1980, *Lee S 41885* (K [K000401830], KEP, L [L.1462431], SAN, SAR); Kuching, Batang Sibu, Sarawak Mangrove FR, 16 May 1962, *Zehnder S 16802* (BO, K [K000401620], L [L.1460300], SAN, SAR, SING); Kuching, Santubong, Togok, sea level, 11 July 1957, *Paie S 8340* (SAR); Kuching, Santubong, Ulu Sg Jaong, 30 March 1973, *Hj. Bujang & Jugah S 33048* (L [L.1460297], SAR); Sematan Sub-District, Kg Pueh, 29 June 1974, *Mamit S 34595* (SAR).

13. *Dracaena multiflora* Warb. Ex P.Sarasin & Sarasin, Reisen in Celebes 1 (1905) 136. (Figure 5)

Synonym: *Pleomele multiflora* (Warb. ex P.Sarasin & Sarasin) Merr. in Enum. Philipp. Fl. Pl. 1 (1923) 205. Type: INDONESIA. Celebes, Gorontalo, 18 March 1895, *Sarasin 905* (holotype: B [B 100184003]).

Treelet or small tree to 5–18 m tall, stems usually several from the base or lower portions, reaching 10–60 cm diameter. Branch/stem diameter below inflorescence 2–3 cm. Vegetative growth continuous, the long-leaf production not interrupted by episodes of reduced or bract-like leaves, but leaves are typically retained in terminal or subterminal clusters or rosettes. Leaf shape linear, widest at mid-blade, length: width ratio 20 or more, (28–)40–60 cm long or more, 1–2.5 cm wide, stiffly ascending and sword-like, leaf base broadly laminate. Inflorescence 35–45 cm long but reaching 1 m (rachis similarly long, 8–14 mm diameter), conspicuously branched (sometimes to two orders) throughout its length, branches solitary or sometimes in fascicles of several, (6–)15–30 cm long or more; distance from base of the primary branch to the first fascicle 2–8.4 cm long, internodes between fascicles up to 16 mm long. Flowers 3–4 per fascicle; perianth not seen; pedicels below the articulation 2.5–4 mm long, above the articulation not discernible. Fruits globose to 2–3-lobed, 5 × 5–7 mm, ripening orange-red.

Distribution and habitat: Plants of highly exposed environments. Philippines, Sulawesi. In Borneo, only known from the Semporna Islands off E Sabah. Rocky slopes, summits, and ledges, as well as at the sea fringe.

Etymology: Latin: *multi*, many; *flos*, flower.

Additional specimens examined: MALAYSIA. Sabah: East Coast, Mt. Sidungol, rocky hillside, 70 ft., 18 July 1938, *Keith 9287* (SING); Semporna islands, Boheydulang Island, slope on west side ringed by Tetagan, Gaya and Boheydulang Islands. 11 October 1998, *Wong WKM 2840* (SAN).

14. *Dracaena pereirae* K.M.Wong, sp. nov. (Figure 16)

Type: MALAYSIA. Sabah, Lahad Datu, Pulau Sakar, 15 March 1961, *Brand SAN 24587* (holotype: L [L.1461850]; isotypes: BO, K [K000401521], KEP, SAN, SING).

Resembling *Dracaena borneensis* (Merr.) Jankalski except the leaves are only 6–8 mm wide and mostly not longer than 30 cm (vs. (8–)15–25(–30) mm wide and mostly 40 cm long or more) and the inflorescences are 20–35 cm long (vs. (29–)38–65 cm long).

Treelet to c. 5 m tall. Branching mostly much above the base. Branch/stem diameter below inflorescence 3–5 mm. Vegetative

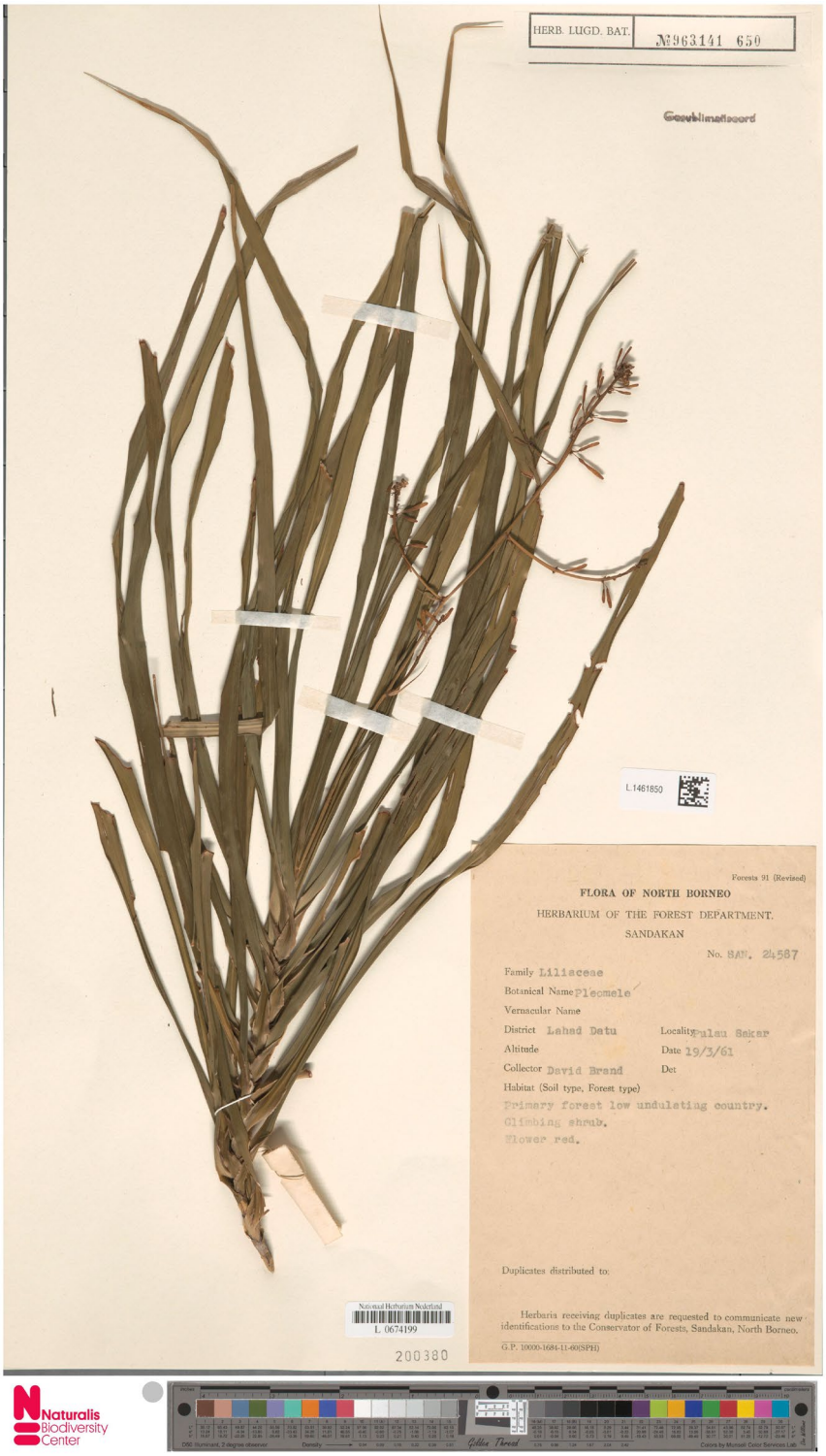

FIGURE 16 | *Dracaena pereirae*, holo at L. (Courtesy of Naturalis Biodiversity Center, Netherlands).

growth continuous along stems/branches, the long-leaf production not interrupted by episodes of reduced or bract-like leaves, but leaves on axes are typically retained for significant lengths of time. Leaf shape linear, widest at mid-blade, length: width ratio 25–60 or more, (10–)25–30 cm long, 6–8 mm wide, thin and supple, leaf base broadly laminate. Inflorescence 20–35 cm long (rachis 12–25.5 cm long, 1–2 mm diameter), conspicuously branched along its length, branches 3–11 cm long; distance from base of the branch to the first fascicle 7–24 mm long, internodes between fascicles up to 16 mm long; bracts on the proximal end of inflorescence linear, 4.5–9.2 cm long, 2–3.5 mm wide. Flowers 2–4 per fascicle; perianth 17.5–19.5 mm long in open flowers, including c. 7 mm long lobes; pedicels below the articulation 2–3.5 mm long (3–4 mm long in fruits), above the articulation not discernible to 1 mm long (1–2 mm in fruits). Fruits globose to bilobed, 5–11 × 6–12 mm.

Distribution and habitat: Sabah: ultramafic substrates.



FIGURE 17 | *Dracaena rimiae*, holo at SAN. (Photo: P.K. Hoo).

Etymology: After Joan Teresa Pereira, b. 1970, Forest Botanist at Forest Research Centre, Sepilok, Sandakan, Sabah in 1994, later Head of Systematic Botany.

Additional specimens examined: MALAYSIA. Sabah: Lahad Datu, Pulau Sakar, Look Magulang, 11 April 1962, *Muin SAN 29376* (K [K000401525], SAN); Lahad Datu, Pulau Sakar, tandjong west of Look Biku, c. 50 ft. asl, 30 April 1962, *Meijer SAN 25367* (K [K000401526], L [L.1449341], SAN, SAR, SING); Mt. Kinabalu, Eastern Shoulder, 3000 ft., 28 July 1961, *Chew, Corner & Stainton RSNB 225* (BO, K, L [L.1460510], SING); Tawau, 3 miles north of Tawau, summit of Tanjong Batu Hill, 350 ft. asl, 8 November 1955, *Wood SAN 17202* (A [02656561], BO, BRI, K, KEP, L [L.1461822], SING); Tawau, Mt. Wullersdorf, on rhyolite rocks, 2500 ft., 5 December 1963, *Meijer SAN 41050* (SAN).

15. *Dracaena rimiae* K.M.Wong, sp. nov. (Figure 17)

Type: MALAYSIA. Sabah, Taman Tunku Abdul Rahman, Pulau Gaya, trail to highest point, 23 March 1995, *Rimi et al. SNP 07292* (holotype: SAN [sheet acc. 112,464]; isotypes: SAN [sheet acc. 103,701], SNP).

Resembling *Dracaena borneensis* (Merr.) Jankalski except the leaf bases are pseudo-petiolate (vs. broadly laminate) and the inflorescence unbranched or with only 1–2(–5) basal branches (vs. conspicuously branched along the length).



FIGURE 18 | *Dracaena sylvatica*, holo at L. (Courtesy of Naturalis Biodiversity Center, Netherlands).

Treelet 1–3 m high to small tree c. 20 m tall. Branching away from the base. Branch/stem diameter below inflorescence 3–5 mm. Vegetative growth continuous along stems/branches, the long-leaf production not interrupted by episodes of reduced or bract-like leaves, but leaves on axes are typically retained for significant lengths of time. Leaf shape linear, widest at



FIGURE 19 | *Dracaena sylvatica*. (A) Habit. (B) Close-up of flowers, *Hoo HPK 331*, Ulu Sarikei, Sarawak. (Photos: P.K. Hoo).

mid-blade, length: width ratio 10–33, 9.5–34 cm long, 6–19 mm wide, thin and supple, leaf base somewhat gradually narrowed to a pseudo-petiolate portion 1–2 cm long. Inflorescence 24–43.5 cm long (rachis 14–33.5 cm long, 1.5–2.5 mm diameter), unbranched, sometimes with 1–2(–5) basal branches to 3–14 cm long; distance from base of the basal branch to the first fascicle 12–27 mm long, internodes between fascicles up to 13 mm long; bracts on the proximal end of inflorescence linear, 2.6–7.3 cm long, 1.6–3 mm wide. Flowers 2–4 per fascicle; perianth 26–27.5 mm long in open flowers or buds at advanced stage, including 15–17 mm long lobes; pedicels below the articulation 2–4 mm long (similarly so in fruits), above the articulation not discernible (c. 2 mm long in fruits). Fruits globose, bilobed or trilobed, 6–9 × 7–10 mm.

Distribution and habitat: Sabah: uncommon and scattered throughout lowland rain forests on sandstones, also on alluvial sites.

Etymology: After Rimi Repin, b. 1968, botanist and Deputy Director of Sabah Parks.

Additional specimens examined: MALAYSIA. Sabah: Beluran, Timimbang FR, HS Timimbang (B), Cpt 52, 5°59′31″ N, 107°6′9″ E, 86 m, 20 February 2014, *Nur Adillah et al. SAN 156314* (SAN); Keningau, Ulu Sg Pingas-Pingas, 8 March 1985, *Fidilis & Sumbing SAN 110851* (K [K000401547], L [L. 1,460,559], SAN [2 sheets with the same acc. no. 071986], SAR); Nabawan, Sg Pingas-Pingas, Maitland Range area, 14 May 1986, *Fidilis SAN 113931* (K [K000401556], SAN [2 sheets with the same acc. no. 076252]); Nabawan, Sg Pingas-Pingas, Maitland Range area, 19 May 1986, *Fidilis SAN 113983* (SAN [2 sheets with the same acc. no. 076538]); Sandakan, Hutan Simpan Sg Sapi, 23 June 1986, *Patrick SAN 116809* (holo SAN [2 sheets with the same acc. no. 076832]); Sandakan, Mile 60 Labuk Road, 26 January 1965, *Meijer SAN 43374* (K [K000401858], SAN); Sandakan, Telupid, cattle farm Kg Wonod, 7 March 1974, *Aban & Saikeh SAN 79326* (SAN); Sandakan, Telupid, Kg Wonod, trail to Ulu Sg Taviu, 14 March 1974, *Aban & Saikeh SAN 79381* (K [K000401533], L [L.1449159], SAN, SAR); Semporna, Mt. Pock FR, 4°24′40.6″ N, 118°21′10.7″ E, 488 m, s.d., *Suzana et al. SAN 149474* (SAN); Tongod, Keramuak, Bt Mengalas-Kalas, 50 m, 14 March 1981, *Dewol SAN 93569* (K [K000401537], SAN).

16. *Dracaena sylvatica* K.M.Wong & P.K.Hoo, sp. nov. (Figures 18 and 19)

Type: BRUNEI. Temburong, West Ridge above Kuala Belalong Field Studies Centre, 4°30′ N, 115°10′ E, 250 m, 23 February 1991, *Argent & Mitchell 91107* (holotype: L [L.1448328]; isotypes: BRUN, E, K [K000401500]).

Resembling *Dracaena hosei* (Ridl.) Jankalski except for inflorescences which are unbranched or with 1–2(–5) basal branches (vs. conspicuously branched along the length) and broadly laminate leaf bases (vs. bases with abruptly infolded sides); and *D. kerangasensis* P.K.Hoo & K.M.Wong except for (6–)10–17 (not 1.5–4) mm wide leaf blades.

Treelet 1.5–2.5 m. Branching mostly above the base. Branch/stem diameter below inflorescence 3–4 mm. Vegetative growth continuous along stems/branches, the long-leaf production not interrupted by episodes of reduced or bract-like leaves, but leaves on axes are typically retained for significant lengths of time. Leaf shape linear, widest at mid-blade, length: width ratio 30–45, 9–35 cm long, (6–)10–17 mm wide, thin and supple, leaf base broadly laminate. Inflorescence 18–40 cm long (rachis 14–30 cm long, 1–2 mm diameter), unbranched or with 1–2(–5) basal branches, branches 0.8–16.5 cm long; distance from base of the branch to the first fascicle

4–27 mm long, internodes between fascicles up to 18 mm long; bracts on the proximal end of inflorescence linear, 4.4–6.5 cm long, 1.5–4 mm wide. Flowers (1–)2–5 per fascicle; perianth 26–28 mm long in open flowers or buds at advanced stage, including 15–17 mm long lobes; pedicels below the articulation 2–5 mm long (3.5–8 mm long in fruits), above the articulation not discernible (not discernible to sometimes only c. 1 mm in fruits). Fruits ellipsoid to bilobed, 8–12 × 7–12 mm.

Distribution and habitat: Brunei: only known from Temburong district and Sarawak: Ulu Sarikei, on shale; possibly also Sabah (*Hoo et al. SAN 164135*, Sg. Imbak buffer zone).

Etymology: Latin, *sylva*: forest or woodland.

Additional specimens examined: BRUNEI. Temburong, Amo, W of K Belalong, catchment of Sibut R headwaters, 4°32′ N, 115°08′ E, 300 m, 22 March 1991, *Sands et al. 5508* (A [02656472], BRUN, K [K000401504], L [L.3807920, WAG.1152290], SAR, SING); Temburong, Batu Apoi, Ulu Senuko—Ulu Katop watershed, 700 ft., 2 August 1957, *Ashton BRUN 361* (SING); Temburong, Batu Apoi Forest Reserve, ridge W. of Kuala Belalong Field Studies Centre, 4°33′ N, 115°9′ E, 250 m, 31 March 1991, *Poulsen 37* (AAU, BRUN, K [K000401505]); Temburong, behind Kuala Belalong Field Studies Centre, 4°33′ N, 115°9′ E, 450 m, 31 July 2002, *Middleton et al. 786* (A [02744458], BRUN, E [E00679119], K [K000401510], L two sheets [L.3809056, L.3809525]); Temburong, Bukit Belalong, 500 m, 26 February 1992, *Dransfield et al. JD 7226* (BRUN, K [K000401507], L [L.3886599]); Temburong, Kuala Belalong Field Studies Centre, Batu Apoi Forest Reserve, ridge W of Belalong camp, 4°33′ N, 115°9′ E, 150 m, 4 March 1991, *Nielsen & Balslev 989* (K [K000401501]). Temburong, ridge enclosed by upstream Belalong river and upstream Temburong river, 200–300 m, 8 July 1989, *de Vogel 8942* (BRUN, SING). **MALAYSIA. Sarawak:** Ulu Sarikei, Wong Ruan, near stream, 1 April 2025, *Hoo HPK 331* (SAR).

Acknowledgments

Dr. Felix F. Merklinger (Faculty of Biology, Technical University of Dresden) is thanked for tracing Sarasin & Sarasin's *Reisen in Celebes* and the type image of their *Dracaena multiflora*. Curators of the various collections at Bogor (Dr Himmah Rustiami, Dr. Ridha Mahyuni), Brunei (Joffre Hj Ali Ahmad, Muhd. Ariffin bin A. Kalat, Mediana bin Kampong), Sabah (Dr J. Pereira and John Sugau), Sarawak (Datin Runi Sylvester, Julia Sang and C.Y. Ling) and Singapore (Dr Jana Škornicková, Serena Lee, Bazilah Ibrahim and their team) are much thanked for facilitating study of collections in their care. Bazilah Ibrahim assisted with some scanned images of *Dracaena* specimens. J. Pereira, Eyen Khoo, Peter Boyce, Reuben Lim, Dr. Louise Neo, and Tan Kai Ren helped make possible field observations of Bornean *Dracaena*. Dr. Lu Pei-Luen (National Taitung University, Taiwan) kindly provided literature and discussions associated with her phylogenetic research into *Dracaena* and *Sansevieria*. Sebastian C. Wong assisted with specimen listing and Alviana Damit with checking of some localities. P.K. Hoo and S.Y. Wong's fieldwork in Sabah and Sarawak was funded by UNIMAS Biodiversity Research Grant Scheme (BRG): UNI/I01/BRG/85879/2023.

Funding

This work was supported by Universiti Malaysia Sarawak Biodiversity Research Grant Scheme (BRG), UNI/I01/BRG/85879/2023.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

References

Barthlott, W., A. Hostert, G. Kier, et al. 2007. "Geographic Patterns of Vascular Plant Diversity at Continental to Global Scales." *Erdkunde* 61: 305–315. https://doi.org/10.3112/erdkunde.2007.04.01.

Chen, J., and K. M. Wong. 2023. *Timonius in Borneo with 68 New Species. A Little-Studied, Hyper-Diverse Rainforest Plant Genus in the Guettardeae (Rubiaceae) and Implications for the Taxonomy of an Alliance Widespread Throughout Southeast Asia*. Natural History Publications (Borneo) in Association with National Parks Board Singapore.

Coyne, J. A., and H. A. Orr. 2004. *Speciation*. Sinauer Associates.

Damayanto, I. P. G. P., S. D. Rugayah, S. Sunarti, I. P. Astuti, and E. Primananda. 2026. "A New Species and Synopsis of *Dracaena* (Asparagaceae) From Sulawesi, Indonesia." *Folia Geobotanica* 60: 135–156. https://doi.org/10.1007/s12224-025-09473-0.

de Bruyn, M., B. Stelbrink, R. J. Morley, R. Hall, G. R. Carvalho, and T. Von Rintelen. 2014. "Borneo and Indochina Are Major Evolutionary Hotspots for Southeast Asian Biodiversity." *Systematic Biology* 63: 879–901. https://doi.org/10.1093/sysbio/syu047.

GBIF. 2026. "Global Biodiversity Information Facility." https://www.gbif.org.

IPNI. 2025. "International Plant Names Index." https://www.ipni.org.

Jankalski, S. 2008. "Subgenera and New Combinations in Dracaena." *Sansevieria* 18: 17–21.

JSTOR. 2025. "JSTOR Global Plants."

Kier, G., J. Mutke, E. Dinerstein, et al. 2005. "Global Patterns of Plant Diversity and Floristic Knowledge." *Journal of Biogeography* 32: 1107–1116. https://doi.org/10.1111/j.1365-2699.2005.01272.x.

Lu, P.-L., and C. Morden. 2010. "Phylogenetics of the Plant Genera *Dracaena* and *Pleomele* (Asparagaceae)." *Botanica Orientalis – Journal of Plant Science* 7: 64–72. https://doi.org/10.3126/botor.v7i0.4385.

Lu, P.-L., and C. Morden. 2014. "Phylogenetic Relationships Among Dracaenoid Genera (Asparagaceae: Nolinoideae) Inferred From Chloroplast DNA Loci." *Systematic Botany* 39: 90–104. https://doi.org/10.1600/036364414X678035.

Mallet, J. 2008. "Hybridization, Ecological Races and the Nature of Species: Empirical Evidence for the Ease of Speciation." *Philosophical Transactions of the Royal Society B: Biological Sciences B, Biological Sciences* 363: 2971–2986. https://doi.org/10.1098/rstb.2008.0081.

Mayr, E. 1942. *Systematics and the Origin of Species From the Viewpoint of a Zoologist*. Columbia University Press.

Medikus, F. K. 1786. *Theodora Speciosa, Ein Neues Pflanzen Geschlecht*. Hof-und Akademischen Buchhandlung.

Merrill, E. D. 1921. "A Bibliographic Enumeration of Bornean Plants." *Journal of the Straits Branch of the Royal Asiatic Society* 45: 1–637.

Merrill, E. D. 1922. "New or Noteworthy Bornean Plants, Part 1." *Journal of the Straits Branch of the Royal Asiatic Society* 85: 151–201.

Myers, N., R. A. Mittermeier, C. G. Mittermeier, G. A. B. da Fonseca, and J. Kent. 2000. "Biodiversity Hotspots for Conservation Priorities." *Nature* 403: 853–858. https://doi.org/10.1038/35002501.

Neo, L. 2023. *The Endemic Plant Genera of Borneo*. Natural History Publications (Borneo) in Association with National Parks Board Singapore.

Neo, L., H. T. W. Tan, and K. M. Wong. 2021. "Centres of Endemism in Borneo and Their Environmental Correlates Revealed by Endemic Plant Genera." *Flora* 285: 151966. https://doi.org/10.1016/j.flora.2021.151966.

POWO. 2025. “Plants of the World Online.” https://powo.science.kew.org.

Rendle, A. B. 1901. “Mr. Charles Hose's Bornean Monocotyledons.” *Journal of Botany, British and Foreign* 39: 173–179.

Ridley, H. N. 1930. “Asiatic Species of *Pleomele*.” *Journal of Botany, British and Foreign* 68: 177–181.

Roos, M. C., P. J. A. Keßler, S. R. Gradstein, and P. Baas. 2004. “Species Diversity and Endemism of Five Major Malesian Islands: Diversity-Area Relationships.” *Journal of Biogeography* 31: 1893–1908. https://doi.org/10.1111/j.1365-2699.2004.01154.x.

Roxburgh, W. 1814. *Hortus Bengalensis, or a Catalogue of the Plants Growing in the Honourable East India Company's Botanic Garden at Calcutta*. Mission Press.

Roxburgh, W. 1832. *Flora Indica, or, Descriptions of Indian Plants, Vol. 2*, edited by W. Carey. W. Thacker and Co and Parbury, Allen and Co.

Rumpf, G. E., and G. E. Rumphius. 1741–1755. *Herbarium Amboinense; Nunc Primum in Lucem Edidit, and in Latinum Sermonem Vertit Joannes Burmannus*. Apud Fransicum Changuion Joannem Ctuffe, Hermannum Uytwerf.

Saw, L. G. 2012. “A Revision of *Licuala* (Arecaceae, Coryphoideae) in Borneo.” *Kew Bulletin* 67: 577–654. https://doi.org/10.1007/s12225-012-9414-0.

Thiers, B. Continuously updated. “Index Herbariorum: A Global Directory of Public Herbaria and Associated Staff.” http://sweetgum.nybg.org/ih/.

Wilkin, P., P. Suksathan, K. Keeratikiat, P. V. Welzen, and J. Wiland-Szymanska. 2012. “A New Threatened Endemic Species From Central and Northeastern Thailand, *Dracaena jayniana* (Asparagaceae: Tribe Nolinoideae).” *Kew Bulletin* 67: 697–705. https://doi.org/10.1007/s12225-012-9412-2.

Wilkin, P., P. Suksathan, K. Keeratikiat, P. V. Welzen, and J. Wiland-Szymanska. 2013. “A New Species From Thailand and Burma, *Dracaena kaweesakii* Wilkin & Suksathan (Asparagaceae Subfamily Nolinoideae).” *PhytoKeys* 26: 101–112. https://doi.org/10.3897/phytokeys.26.5335.

Wong, K. M. 2016. *Studies in Southeast Asian Melastoma (Melastomataceae), 2. The Genus Melastoma in Borneo Including 31 New Species*. Natural History Publications (Borneo) in association with National Parks Board Singapore.

Wong, K. M. 2017. *The Genus Saurauia in Borneo. A Revision With 62 New Species*. Natural History Publications (Borneo) in association with National Parks Board Singapore.

Wong, K. M., and J. B. Sugau. 1996. “A Revision of *Fagraea* (Loganiaceae) in Borneo, With Notes on Related Malesian Species and 21 New Species.” *Sandakania* 8: 1–93.

Wong, K. M., J. B. Sugau, J. T. Pereira, B. S. Parris, and B. C. Tan. 1999. “New Records of Bornean Plants From the Semporna Islands Off Sabah's East Coast.” *Sandakania* 13: 31–40.

Wong, S. Y. 2023. “Flora of Borneo: The Vascular Plant Genera.” *Webbia* 78: 1–309.