

Two new species and one new subspecies of *Ridleyandra* (Gesneriaceae) from Peninsular Malaysia

R. Kiew

Forest Research Institute Malaysia,
52109 Kepong, Selangor, Malaysia
ruth@frim.gov.my

ABSTRACT. Two new species, *Ridleyandra bintangensis* Kiew and *R. nuangensis* Kiew, from Kedah and Selangor respectively, and one new subspecies, *R. kiewii* subsp. *magnifica* Kiew, from Kelantan and Terengganu, are described from Peninsular Malaysia.

Keywords. Gesneriaceae, Kelantan, Peninsular Malaysia, *Ridleyandra bintangensis*, *R. nuangensis*, *R. kiewii* subsp. *magnifica*, Terengganu

Introduction

One of the aims of the *Flora of Peninsular Malaysia* project is to explore areas that are unknown or poorly known botanically (Kiew & Rafidah, 2007) and this has proved fruitful in terms of the discovery of new species. Since the establishment and revision of *Ridleyandra* (Weber & Burtt, 1998a, 1998b), four new species have been described from Peninsular Malaysia, *R. chuana* Kiew (Kiew, 2013), *R. iminii* Siti-Munirah (Siti-Munirah, 2012), *R. kelantanensis* Kiew (Kiew, 2009) and *R. padangensis* Kiew (Kiew, 2011). Here a further two species and one subspecies are described bringing the total number of species for Peninsular Malaysia to 21. Conservation assessments for these species will be included in a forthcoming paper on conservation in the genus as a whole.

Taxonomy

1. *Ridleyandra bintangensis* Kiew, sp. nov.

Among *Ridleyandra* species with leaves with an entire margin, inflorescences with more than one flower, and long corollas, it most resembles *Ridleyandra atropurpurea* (Ridl.) A. Weber but it differs from that species in its short petioles 1.3–2.5 cm long (c. 4.5 cm long in *R. atropurpurea*), its relatively broader oblong leaves less than three times as long as wide (not falcate and more than three times as long as wide in *R. atropurpurea*), c. 9 pairs of lateral veins (15–17 pairs in *R. atropurpurea*), and a corolla that is cylindric and 10–13 mm wide at the mouth with very short lobes 2–3 mm long (trumpet-shaped and 14–18 mm wide at the mouth with lobes 5–12 mm long in *R. atropurpurea*). While both species have rosy purple corollas with white

lines on the lower side, the lobes of *Ridleyandra bintangensis* are black while those of *R. atropurpurea* are concolorous with the tube. TYPE: Peninsular Malaysia, Kedah, Sungai Selim FR (Forest Reserve), Compartment 15, trail to Gunung Bintang, 30 October 2008, Mohd. Hairul FRI 60092 (holotype KEP; isotypes SAN, SAR, SING). (Fig. 1A, 2).

Perennial herb. **Stem** woody, unbranched, erect, to 10 cm tall, c. 6 mm diam. **Leaves** in more-or-less equal pairs, tightly clustered in a rosette at top of the stem; petioles, leaf margin and lower surface of midrib and lateral veins densely pubescent, hairs brown, c. 1 mm long; petioles 1.3–1.7(–2.5) cm long; lamina oblong to slightly oblanceolate, 10–13 × 3.5–5 cm, glossy, slightly bullate, glabrous above; base slightly unequal, rounded to shortly auriculate, margin entire, wavy towards the apex, apex acute; midrib and lateral veins flat above, prominent beneath, lateral veins c. 9 pairs. **Inflorescences** axillary, (1–)2-flowered cyme, peduncle, bracts and calyx glabrous; peduncles deep purple-brown, (5–)8–9.5 cm long; bracts 3, free, positioned immediately below the flowers, reddish brown, lanceolate, 10–13 × 4 mm, apex acute; pedicel 4–13 mm long. **Sepals** divided to base, reddish brown, narrowly lanceolate, 8–12 × 2–2.5 mm, apex acute. **Corolla** cylindric, c. 5.5 cm to tip of lower lip; tube with a white bulbous base, constricting to 3–4 mm diam., then expanded to 10–13 mm, above the base rosy purple with white lines on lower side, mouth glabrous; lobes 5, dull black, upper lobes reflexed, c. 2.5 × 6 mm, lower lobes unequal, lateral lobes reflexed, c. 2 × 5.5 mm, median lobe extended c. 2 × 5.5 mm. **Stamens** 4 in 2 pairs, attached c. 12 mm above corolla base, filaments white, lower pair 13–15 mm long, upper pair 8–9 mm long; anthers pale creamy white, c. 1.5–1 mm, without connective, staminode 1, c. 2 mm long; nectary a narrow white ring, c. 1–1.5 mm high. **Ovary** and style 2.7–3.5 cm long; stigma white, broadly triangular, c. 2.5 × 3 mm. **Capsules** unknown.

Distribution. Endemic in Peninsular Malaysia, known only from the type locality.

Habitat. Primary lowland dipterocarp forest at 380 m altitude.

Etymology. It is named for the type locality, Gunung Bintang, Kedah.

Notes. The flower characters that distinguish this species from *Ridleyandra atropurpurea*, corolla narrowly cylindric with black lobes vs. trumpet shaped with rosy purple lobes, suggest different pollination syndromes but there are as yet no observations of pollinators in *Ridleyandra*.

There is another species, *Ridleyandra petiolata* (Ridl.) A. Weber, also described from Gunung Inas in the Bintang FR. However, that species is clearly distinct from *Ridleyandra bintangensis* in its petioles that are 4–8 cm long with reddish hispid hairs, broader laminas 5–7.5 cm wide with a crenulate-serrate margin, and long reddish hispid peduncles 15–25 cm long. According to the key in Ridley (1923) (under *Didissandra*), the corolla of *Ridleyandra petiolata* is violet-purple. It was collected above 1500 m altitude. This mirrors the Cameron Highlands where the two *Ridleyandra* species, *R.*

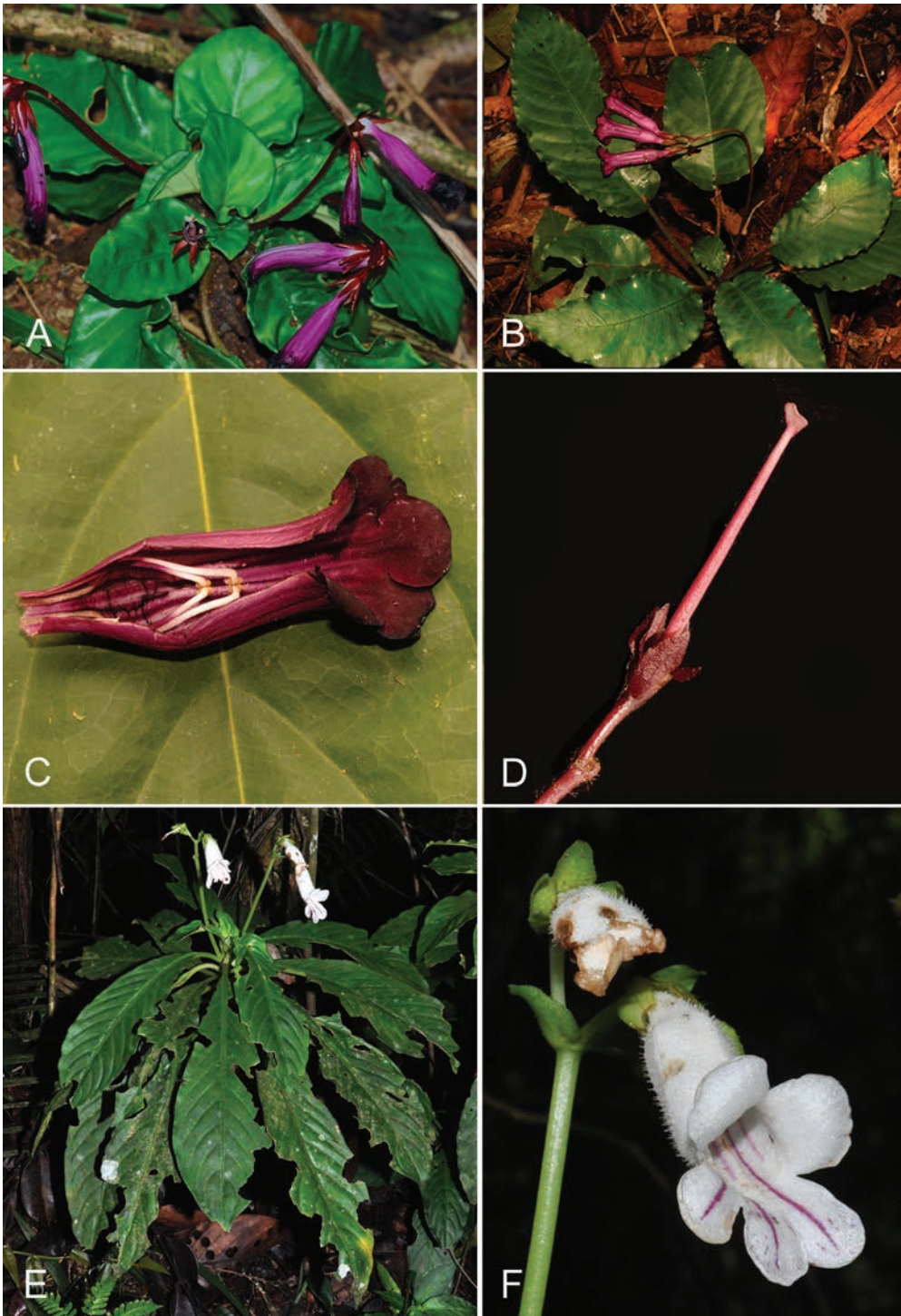


Fig. 1. *Ridleyandra bintangensis* **A.** Habit. *R. kiewii* subsp. *magnifica*. **B.** Habit. **C.** Corolla opened to show stamens. **D.** Calyx, style and stigma. *R. nuangensis* **E.** Habit. **F.** inflorescence and flower. (Photos: A, Ong P.T.; B–D, M.Y. Siti-Munirah; E–F, Yao T.L.)

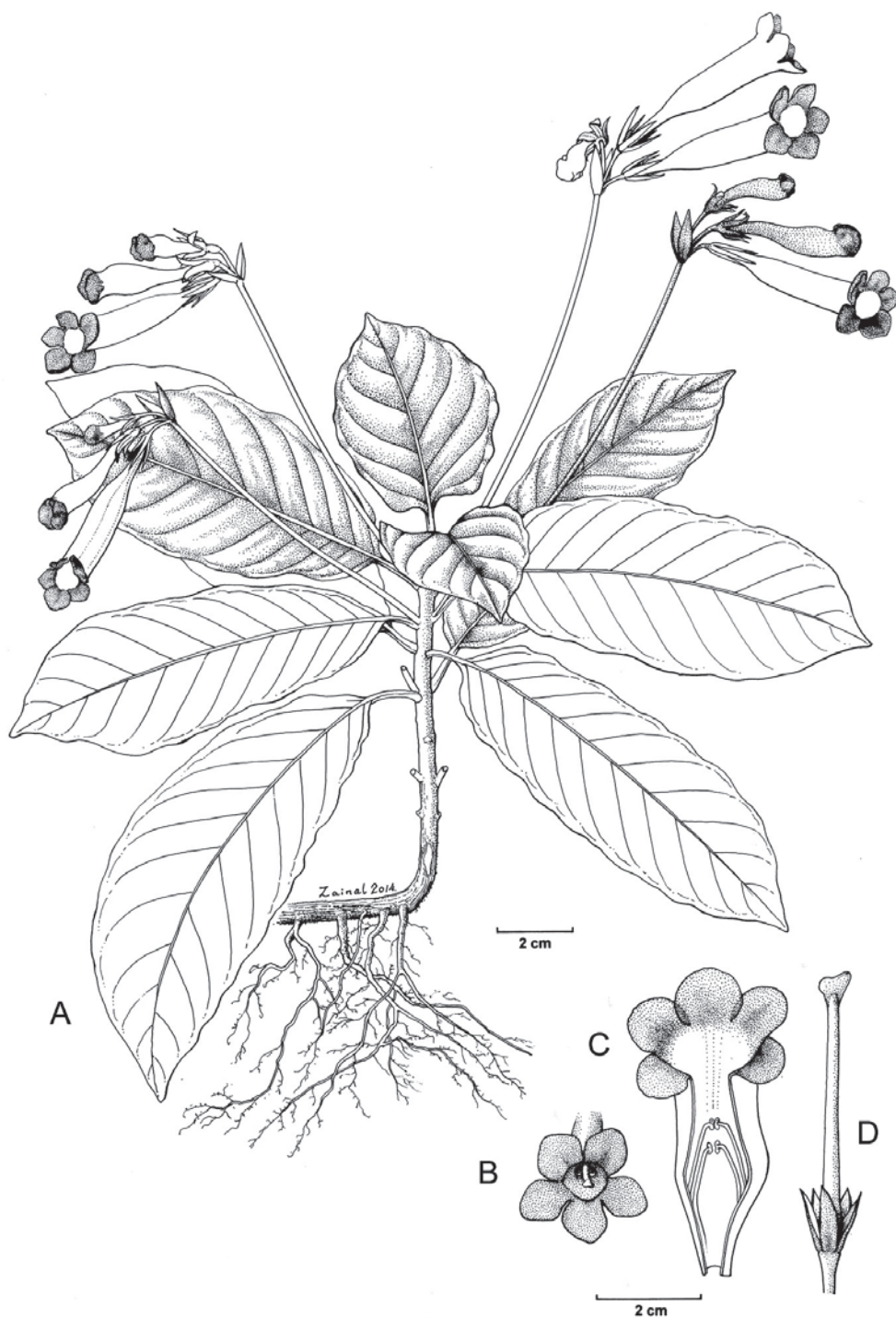


Fig. 2. *Ridleyandra bintangensis*. **A.** Habit. **B.** Corolla (front view). **C.** Corolla opened to show position of stamens. **D.** Calyx and pistil. (All from *FRI 60092* drawn by M. Zainal).

morgani (Franch.) A. Weber and *R. longisepala* (Ridl.) A. Weber, are also separated by altitude.

Weber & Burt (1998b) drew attention to another specimen collected from the Gunung Bintang range (*Mohd Haniff SFN 21092*) that they suggested might be a new taxon but in its petiole 3.5–4.5 cm long, its leaves more than three times longer than wide, its 13–15 pairs of lateral veins, and its broader corolla (14–17 mm wide) with lobes 5–6 mm long, it is clearly similar to *Ridleyandra atropurpurea* (Ridl.) A. Weber.

2. *Ridleyandra kiewii* (Kiew) A. Weber, Beitr. Biol. Pflanzen 70: 243 (1998 [‘1997’]). – *Didissandra kiewii* Kiew, Malay. Nat. J. 41: 212 (1989). TYPE: Peninsular Malaysia, Johor, Selai Valley, *Kiew*, B.H. SB 35 (holotype KEP ex UPM).

Perennial herb. **Stem** woody, unbranched to 20 cm long, to 7 mm diam., flowering at c. 5 cm tall; densely hispid with ferruginous hairs 4–5 mm long on the young stem, petioles, peduncles, bracts and calyx. **Leaves** crowded at the apex; petioles 6–9 cm long; lamina broadly elliptic, 10–40 × 6–18.5 cm, base cordate or rounded, sometimes unequal, margin serrate, crenate to undulate, apex broadly acute to acuminate, in live state upper surface glossy dark green above, bullate and wrinkling on drying or flat, either variegated with a broad light green band c. 2.5 cm wide along midrib or plain green, reddish or pale green beneath, drying membranous, glabrous above, beneath midrib shortly hispid and lateral veins minutely pubescent; lateral veins 9–18 pairs, prominent beneath. **Inflorescences** axillary, cymose, either 1–3-flowered or with up to 7 flowers; peduncles purple, 9–24.5 cm long; bracts narrowly lanceolate and 12–15 × 1–1.5 mm or foliose and 11–12 × 7–8 mm; pedicels 4–12 mm long. **Calyx** 10–16 mm long, divided almost to the base, lobes 5, ligulate, 4–10 × 3–5 mm. **Corolla** narrowly trumpet-shaped, outside deep purple-red or purple or tinged black, inside intensely black, 3.5–5 cm long, 0.3–0.4 mm wide at base, 1–1.5 cm wide at the mouth, lobes broad and rounded, upper two lobes more-or-less erect, 2–4 × 6–9 mm, lower three lobes 2–5 × 4–8 mm, projecting slightly beyond the upper. **Stamens** 4, filaments slender, white or pale purple, lower two 19–20 mm long, upper two c. 12 mm long; anthers connivent, reniform, 1.5–3 × 1–1.5 mm, cream-coloured, contrasting strongly with black corolla. **Ovary** narrowly cylindrical, 20–34 × 1–2 mm, glabrous, surrounded at base by a fleshy cylindrical nectary, c. 1 mm high; style narrowing to a broadly triangular pale purple stigma c. 3 × 2.5 mm wide, stigma reaching the same level as the anthers of the shorter stamens. **Capsules** glossy, dark red or purple, curved downwards at the apex, splitting along the upper surface, 5–8 cm long, 2–6 mm wide.

Notes. It is one of the most striking *Ridleyandra* species with its large, purple-black flowers and its variegated foliage. It was first discovered in Johor but recent exploration shows that it also occurs in S Pahang, Terengganu and Kelantan. Compared with most *Ridleyandra* species that are montane plants with narrow distributions, *R. kiewii* grows in the lowlands and is the *Ridleyandra* species with the widest geographic distribution.

The new taxon, while it is a larger plant with more serrate laminas, foliose bracts and more flowers, resembles *R. kiewii* in its leaf shape, relatively long petioles, indumentum, corolla size, shape and in its striking purple-black colour. It is treated at subspecific rank because the two taxa are separated geographically. The species description above is amended to take account of the new subspecies.

2a. *Ridleyandra kiewii* subsp. *kiewii*

Figure: Malayan Naturalist. 40, 2 (1986) front cover.

Lamina (10–)14(–18) × (6–)8(–9) cm, base cordate, sometimes rounded, margin crenate to undulate, apex broadly acute, in live state upper surface bullate, sometimes flat, variegated with a broad light green band c. 2.5 cm wide along midrib, reddish beneath; lateral veins c. 9 pairs. **Inflorescence** a 1–3-flowered cyme; peduncle 9–18 cm long; bracts narrowly lanceolate, 12–15 × 1–1.5 mm; pedicels 4–5 mm long; ovary c. 20 × 1 mm. **Capsules** 5–5.5 cm long, 2 mm wide.

Distribution. Peninsular Malaysia: Johor (Gunung Chabang Tiga, Sungai Selai) and S Pahang (Gunung Lesong).

Habitat. Primary lowland dipterocarp forest to 400 m altitude.

2b. *Ridleyandra kiewii* subsp. *magnifica* Kiew, **subsp. nov.**

Compared with the typical subspecies, *Ridleyandra kiewii* subsp. *magnifica* is a larger plant with larger leaves with more lateral veins and a more serrate margin, the inflorescences have foliose bracts and in most cases there are more flowers per inflorescence and the fruits are larger. TYPE: Peninsular Malaysia, Terengganu, Hulu Terengganu, Tembat FR, Sungai Puah, 4 April 2009, *Mohd. Hairul et al. FRI 60959* (holotype KEP; isotypes L, SAN, SAR, SING). (Figs 1B–D, 3).

Lamina (12–)22.5–26.5(–40) × 11.5–18.5 cm, base rounded, sometimes cordate, margin serrate, apex acute to acuminate, in live state upper surface flat, sometimes bullate, most plants not variegated, sometimes variegated, especially in young plants; lateral veins 11–18 pairs. **Inflorescence** usually a cyme with (2–)5–7 flowers, sometimes with 1–3-flowers; peduncle (13.5–)19.5–24.5 cm long, branches 1–3.5 cm long; bracts foliose, broadly ovate, 11–12 × 7–8 mm; pedicels deep purple, 4–12 mm long; ovary c. 34 × 2 mm. **Capsules** 6.5–8 cm long, 4–6 mm wide.

Distribution. Peninsular Malaysia: Kelantan (Kuala Aring), Terengganu (Telemong FR, Tembat FR).

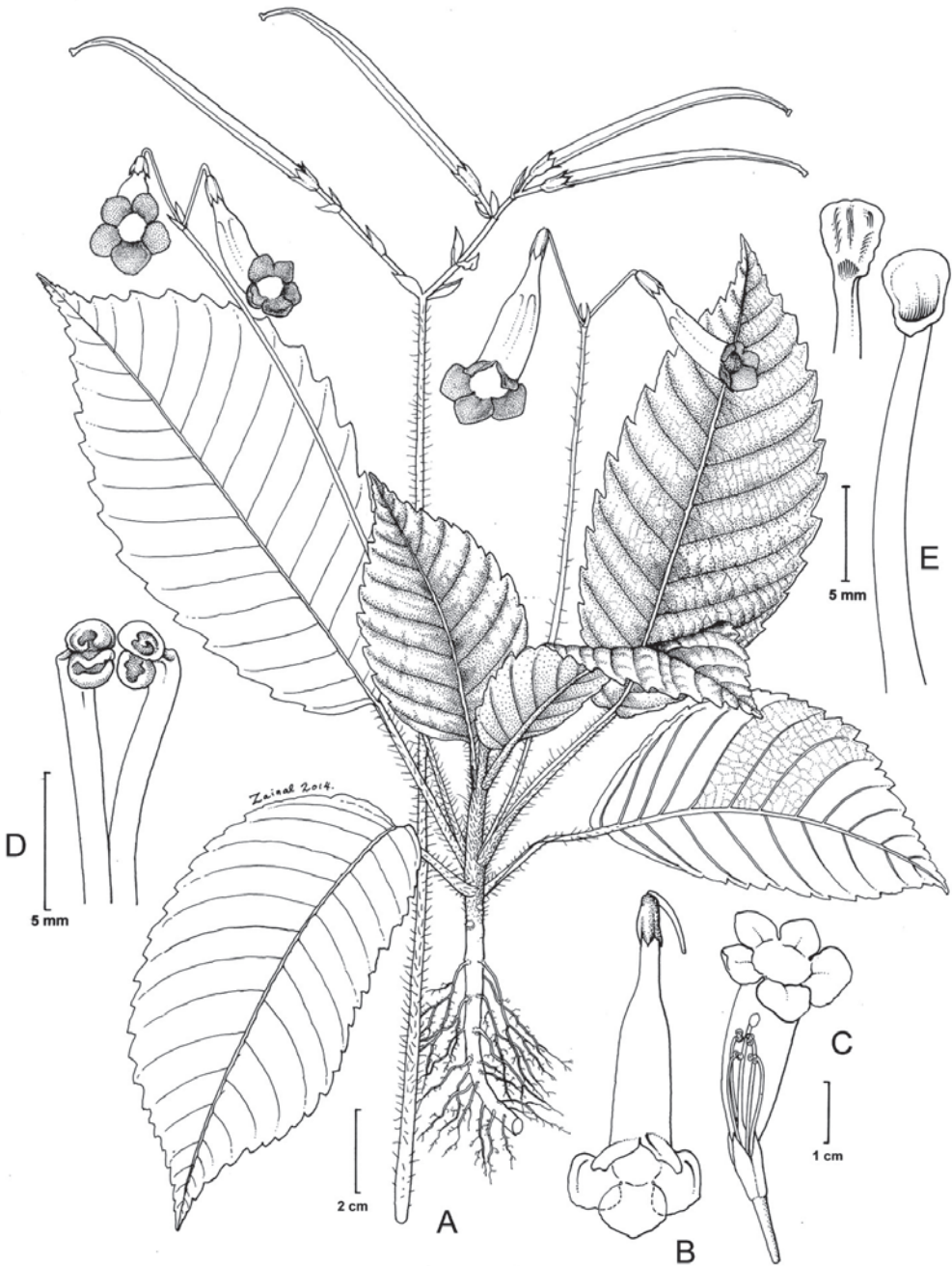


Fig. 3. *Ridleyandra kiewii* subsp. *magnifica*. **A.** Habit. **B.** Flower. **C.** Flower to show position of stamens and pistil. **D.** Pair of stamens. **E.** Style and stigma. (All from *FRI 67096* drawn by M. Zainal).

Habitat. Primary lowland dipterocarp forest, on shaded slopes in valleys above streams, often locally common, below 450 m altitude. In April 2009 it flowered gregariously and in July 2006 most plants were observed with fruits suggesting that it flowers seasonally.

Etymology. With its bunches of large, purple-black flowers, it is a magnificent species well worthy of cultivation and, compared with the typical subspecies, it is a larger plant both in its leaves and fruits.

Additional specimens examined. PENINSULAR MALAYSIA: **Kelantan:** Kuala Aring FR, 1995, *B.H. Kiew KBH 5* (KEP, E, K). **Terengganu:** Hulu Terengganu, Tembat FR, Sg. Puah, 1 April 2009, *Mohd Hairul et al. FRI 60932* (KEP, SAN); *ibidem*, 4 April 2009, *Kamarul-Hisham et al. FRI 67096* (KEP, A, K, L, SAN, SING); Tembat FR, Sg. Tembat, 3 June 2010, *Ong et al. FRI 71064* (KEP, SING); Hulu Terengganu, Ulu Telomong, Ulu Sungai Telemong, July 2006, *R. Kiew RK 5343* (KEP, E, K, L, SAN, SAR, SING).

3. *Ridleyandra nuangensis* Kiew, *sp. nov.*

In its narrowly oblanceolate leaves and its white flowers with purple lines, it resembles *Ridleyandra wrayi* (Ridl.) A. Weber. However, it is distinct from that species in its entire leaves (dentate in *Ridleyandra wrayi*), its long peduncled, 2–3-flowered inflorescences (single flowered with peduncles to 12 cm long in *R. wrayi*) and the bracts that are distant from the calyx (appressed to and enclosing the calyx in *R. wrayi*). TYPE: Peninsular Malaysia, Selangor, Hulu Langat, Gunung Nuang, 21 Feb 2001, *Kiew RK 5186* (holotype SING; isotypes E, KEP). (Figs 1E–F, 4).

Perennial herb. *Stems* woody, unbranched, rarely two-branched, 30–75 cm tall, c. 5 mm diam., with a thin corky ‘bark’. *Leaves* in opposite pairs in a tuft at top of the stem, below to c. 5 mm apart; petioles 1.5–4.3 cm long; lamina oblanceolate, in life glossy green above, whitish green beneath, glabrous, robustly succulent, 12–20 × 3.2–6 cm, narrowed to base, margin entire, apex shortly acuminate, acumen to 5–7 mm long; in life midrib slightly raised above, beneath scarcely prominent, lateral veins 11–13 pairs, slightly prominent beneath, midrib and veins drying dark brown beneath. *Inflorescences* axillary, 2–3-flowered cymes with the flowers held high above the leaves on peduncles 11.5–22.5 cm long; bracts and bracteoles asymmetrically ovate, 7–10 × 3–6 mm, c. 9 mm distant from the calyx; pedicels 0.9–2.5 cm; flowers nodding. *Calyx* pale green, 13–15 × 4–5 mm, connate for 2–3 mm, lobes lanceolate, outside keeled, apex acute, margins shallowly toothed in the upper half, inside and out with scattered short glandular hairs. *Corolla* trumpet-shaped, waxy white with a purple line running down the centre of each lobe with the addition of fine lines in base of throat, two white raised ridges (nectar guides) and scattered glandular hairs in throat, minutely densely pubescent with glandular hairs outside, 4.2–6 cm to tip of lower lip;



Fig. 4. *Ridleyandra nuangensis*. **A.** Habit. **B.** Corolla front view. **C.** corolla opened to show position of stamens and pistil. **D.** Nectary. **E.** One pair of stamens. **F.** Calyx and pistil. **G.** Stigma. **H.** Bud. **I.** Half corolla removed to show position of stamens and pistil. (All from *FRI* 77329 drawn by M. Zainal).

tube 3.5–4.5 cm long, 3–7 mm diam. at base dilating to 11–12 mm across the mouth; upper 2 lobes erect, 9–12 × c. 7 mm, lower 3 lobes projecting beyond the upper, 6–10 × 6–7 mm. **Stamens** 4, filaments white, lower pair 13.5–24 mm long, upper pair 17–27 mm long; anthers brown, 2–2.5 × c. 2.2 mm long, joined in pairs. **Nectary** annular, c. 2 mm high. **Ovary** and style glabrous, 17–20 mm; stigma white, broadly triangular, 4–4.5 × 2–3 mm. **Fruit** not known.

Additional specimens examined. PENINSULAR MALAYSIA: **Selangor:** Hulu Langat, Gunung Nuang, 12 Nov 2013, Yao *et al.* FRI 77329 (KEP, SAN).

Distribution. Endemic in Peninsular Malaysia, Selangor (Gunung Nuang), known only from the type locality.

Habitat. In upper montane forest, in deep shade on slope below the summit at 1434 m altitude.

Etymology. It is named for its type locality, Gunung Nuang, Selangor.

Notes. This species is unusual for the genus in several respects: in its tall stem (it is the tallest species), its corky bark and its long peduncles that hold the flowers well above the foliage.

ACKNOWLEDGEMENTS: This study is part of the research carried out for the *Flora of Peninsular Malaysia* Project under ‘Safeguarding the Forest Plant Diversity of Peninsular Malaysia’ Project No. 01-04-01-000 Khas 2 funded by the Ministry of Science, Technology and Innovation through the National Council for Scientific Research and Development and under ‘Dokumentasi and Inventori Flora Malaysia’ Project funded by the 10th Malaysia Plan Development Project at Forest Research Institute Malaysia (FRIM). The project team is grateful to the State Forestry Departments and the Department of Wildlife and National Parks, Malaysia, for permission to make botanical collections; to the FRIM field and herbarium staff for their assistance; to Zainal Mustafa for the botanical drawings; to Ong Poh Teck, M.Y. Siti-Munirah and T.L. Yao for permission to use their photographs; to Dr Gemma Bramley (K) for providing images of *Ridleyandra petiolata* type specimen; to Curators of the BM, K, KLU, SING and UKMB herbaria for permission to examine specimens in their care.

References

- Kiew, R. (2009). Three new species of Gesneriaceae from Kelantan, Malaysia. *Gard. Bull. Singapore* 61: 73–79.
- Kiew, R. (2011). Two new species of Gesneriaceae from Gunung Padang, Terengganu, Malaysia. *Malayan Nat. J.* 63: 661–666.

- Kiew, R. (2013). *Ridleyandra chuana* (Gesneriaceae), a new species from Peninsular Malaysia. *PhytoKeys*. 25: 15–19.
- Kiew, R. & Rafidah, A.R. (2007). The Flora of Peninsular Malaysia. *Conservation Malaysia*. 5: 1–4.
- Siti-Munirah, M.Y. (2012). *Ridleyandra iminii* (Gesneriaceae), a new species from Peninsular Malaysia. *PhytoKeys* 19: 67–70.
- Ridley, H.N. (1923). *Gesneriaceae. The Flora of the Malay Peninsula* 2: 495–547. London: L. Reeve & Co.
- Weber, A., Burt, B.L. (1998a [‘1997’]). *Didissandra*: redefinition and partition of an artificial genus of Gesneriaceae. *Beitr. Biol. Pflanzen* 70: 153–177.
- Weber, A. & B.L. Burt (1998b [‘1997’]). Revision of the genus *Ridleyandra* (Gesneriaceae). *Beitr. Biol. Pflanzen* 70: 225–273.

