Lasianthus purpureocalyx (Rubiaceae), a new species from southern Thailand

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Lasianthus purpureocalyx Napiroon, Chamchumroon, Balslev & Chayamarit *sp. nova* (Rubiaceae) from the Khao Ngon Nak hill (Aaonang sub-district, Krabi province, Thailand) is described and illustrated. It is similar to *L. subcalvus* but differs from it in having narrowly lanceolate, 2–3.5 × 12–16 cm leaves, 6–7 corolla lobes, and globose fruits (*versus* leaves oblong-elliptic 5–7 × 16–23 cm, corolla 4-lobed, fruit fusiform). It also resembles *L. purpureus* in leaf morphology, but differs from it in having flowers in sessile cymes instead of fascicular pedicels. Its leaf morphology also bears resemblance to that of *L. foxworthyanus*, but differs from it in having a purple tubular calyx with 6–7 lobes and calyx limb that are shallowly curved or nearly entire (*versus* a pale green campanulate calyx with 4–5 lobes and 5 calyx limb lobes that are lanceolate).

Introduction

The genus *Lasianthus* (Rubiaceae) contains more than 180 species, distributed mostly in tropical Asia, where approximately 160 species are found in primary forests (Zhu 2002, Zhu *et al.* 2012). A number of *Lasianthus* species were recorded in the southeast Asian region during the past century: Ridley (1923) recorded 59 species from the Malay Peninsular, Pitard (1924) recorded 37 species from Indo-China, and Bakhuizen van den Brink (1965) recorded 28 species from Java.

In Thailand, Craib (1934) recorded 47 *Lasianthus* species and five varieties and Zhu (2001) recognized 52 species, one subspecies and 12 varieties. Zhu (2002) proposed that four

Thai species remained undescribed. Currently, the total number of *Lasianthus* species in the Malesian region is 131, including five subspecies and six varieties (Zhu *et al.* 2012). Morphological characters of many species from Thailand seem very similar when herbarium specimens are studied. Observations in the field may disclose previously unrecognized differences.

During an excursion of the Thai Royal Forest Herbarium (BKF) staff to the top of the Khao Ngon Nak hill (Aaonang sub-district, Krabi province, Thailand) in August 2017, we came across a *Lasianthus* species that we could not recognise. Morphological studies of its flowers and fruits proved that we had a new species at hand.

Morphology of the species described here was examined on living material in the field. Morphological characters of closely related species were investigated from living plants, herbarium collections in AAU, BK, BKF, CMU, CMUB, K, KKU, PSU and QBG (acronyms according Thiers cont. updated), and from the relevant literature (Zhu 1994, 1998, 2001, 2002, Zhu *et al.* 2012). The morphological terminology follows Zhu *et al.* (2012).

Lasianthus specimens were identified using keys, descriptions from the literature, and through comparison with specimens at AAU, BK, BKF, CMU, CMUB, K, KKU, PSU and QBG. Plant parts were dissected and examined under a stereomicroscope. Photographs and measurements of plants parts were taken. Specimens were mounted on herbarium sheets and deposited at the Royal Forest Herbarium in Bangkok (BKF) of Department of National Park, Wildlife and Plants Conservation, Thailand.

***Lasianthus purpureocalyx* Napiroon, Chamchumroon, Balslev & Chayamarit, sp. nova** (Appendixes 1 and 2)

TYPE: Thailand. Krabi Province, Aonang sub-district, Khao Ngon Nak nature trail, tropical rain forest on the top of hill, 08°05'20.1"N, 098°46'19.9"E, 500 m a.s.l., 23 August 2017 T. Napiroon, W. Aiyakul, N. Wongthet, W. Muangrom, K. Thaweepanyaporn TN030 (holotype BKF). — PARATYPES: Thailand. Lowland evergreen forest dominated by emergent Dipterocarpaceae, 300 m a.s.l., Khao Nam Khang National Park, Nathawi district, Songkla province, 28 January 2006 S. Gardner ST2265 (BKF); tropical rain forest, 200 m a.s.l., Thapra waterfall, Chang Klang district, Nakhon Si Thammarat, 11 July 2000 Voradol Chamchumroon VC840 (BKF, PBG); in evergreen forest, 150 m a.s.l., Thaleban National park, Satun province, 6 September 1985 J.F. Maxwell 85-837 (BKF, PSU).

ETYMOLOGY: The specific epithet refers to the purple calyx which is distinct in flowering and fruiting plants.

Shrub, 1–3 m tall; branches terete, 3–5 mm in diam., densely pubescent. Leaves opposite, blades narrowly lanceolate, 12–16 × 2–3.5 cm, coriaceous, apex acuminate, base cuneate, margins entire, both surfaces glabrous, midrib sunken adaxially, prominent abaxially, secondary veins 7–8 pairs, ascending at angle of 45°–50° from midrib, curved to margin, prominent on both surfaces, tertiary veins parallel, adaxially

faintly prominent, abaxially prominent, petioles 5 mm long, sparsely pubescent. Stipules broad triangular, 2–3 × 3 mm, persistent, pubescent. Inflorescence cymose, sessile; bracts absent. Flowers sessile; calyx tube tubular, densely appressed pubescent, ca. 0.5 cm long, hirsute, calyx lobes 4, shallowly curved or nearly entire, ca. 3 × 5 mm, apex acute, appressed pubescent on outside; corolla unfolded, with 6–7 lobes, narrowly lanceolate, up to 1 cm long, long hirsute, apex acute. Fruits drupaceous, globose, 5–8 mm in diam., sparsely pubescent, crowned by persistent calyx lobes, very shallowly curved, young fruits pale green changing to dark blue when ripe; pyrenes 4–5. Flowering and fruiting in July–September.

DISTRIBUTION AND HABITAT. This species is known only from southern Thailand. It was found in shade under trees in tropical rain forest, on metamorphic or granitic rock substrates, at 100–500 m a.s.l. It was collected on top of the Khao Ngon Nak hill (Krabi province), where species of Dipterocarpaceae dominate.

Lasianthus purpureocalyx is morphologically similar especially to herbarium specimens of *L. subcalvus*, but it differs from that species by several characters (Appendix 3).

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Appendix 1. *Lasianthus purpureocalyx* (from the holotype). — **A:** Flower. — **B:** Fruit. — **C:** Calyx (fruiting stage). — **D:** Twig and leaf. — **E:** Habitat. — **F:** Calyx (flowering stage).

Appendix 2. *Lasianthus purpureocalyx* (from the holotype, drawn by Wan-wisa Bhuchaisri). — **A:** Leaf arrangement. — **B:** Fruit. — **C:** Flower. — **D:** Drupe with persistent calyx on crown. — **E:** Calyx (early fruiting stage). — **F:** Calyx (early flowering stage). — **G:** Leaf venation.

Appendix 3. Comparison of *Lasianthus purpureocalyx* with morphologically similar species.

	<i>L. purpureocalyx</i>	<i>L. subcalvus</i>	<i>L. purpureus</i>	<i>L. foxworthyanus</i>
Branches	densely appressed, pubescent	glabrous	glabrous	sparsely appressed, pubescent
Leaf (cm)	2–3.5 × 12–16	5–7 × 16–23	2–3.5 × 12–20	3–5 × 9–14
Stipule	3 mm long	5 mm long	1–2 mm long	4–5 mm long
Bracts	absent	absent	absent	persistent
Inflorescences	cyme, sessile	cyme, sessile	fascicle, pedunculate	cyme, sessile
Calyx	5 mm long, tubular; limb shallow curved, nearly entire	4 mm long, campanulate; limb 4-lobbed, lanceolate	1.5–2 mm long, obconic; limb 4-lobbed, minutely toothed	2–3 mm long, campanulate; limb 5-lobbed, lanceolate
Corolla lobes	6–7, narrow, lanceolate	4, ovate-lanceolate	4, lanceolate	4–5, lanceolate
Corolla tube	10–13 mm long	9 mm long	3 mm long	8–10 mm long
Fruit	globose, 0.5–0.8 cm diam., young fruit pale-green, dark-blue when ripe	fusiform, 0.5 cm diam., young fruit white, colour when ripe unknown	subglobose, 0.6 cm diam., colour unknown	globose, 0.5 cm diam., young fruit pale-green, dark-blue when ripe
Pyrenes	4–5	3–4	4	4–5