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A new species and a new record of *Psychotria* (Rubiaceae) from Thailand

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ABSTRACT

A new species, *Psychotria oxyalabastron*, is described, and *P. laui* is newly recorded from Thailand. The description, distribution area, ecological information and taxonomic note are provided.

KEYWORDS: Gentianales, *Psychotria laui*, *Psychotria oxyalabastron*, Psychotrieae, taxonomy.

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INTRODUCTION

Psychotria L. is one of the most diverse genera in the family Rubiaceae. The genus has a pantropical distribution with approximately 1,633 species (POWO, 2023). The genus is characterized by caducous interpetiolar stipules, small flowers with a short and straight corolla tube, corolla lobes valvate in bud, two-locules ovary, with a single ovule in each locule, drupaceous fruits with two pyrenes, seeds hemispherical in cross-section, presence of an ethanol soluble pigment in the seed coat and ruminate endosperm (Hamilton, 1989; Robbrecht, 1989; Nepokroeff *et al.*, 1999; Sohmer & Davis, 2007; Taylor *et al.,* 2020). In addition, dried specimens of the genus are generally greyish-brown or dark reddish-brown colour (Petit, 1964) and make it easily observed in the herbarium.

In Thailand, there have been reports on the species of *Psychotria* by several authors such as Ridley (1911) who reported eight indigenous species from Peninsular Thailand. Pitard (1924) reported four species from Thailand with an additional 22 species from Indo-China. One of the most comprehensive works was by Craib (1934), in which 38 species were recorded from the country. Since then, however, more than a half-century has passed and *Psychotria* in Thailand has never been revised. Thus, it is clear that taxonomic studies on the genus in Thailand are urgently required. Our previous extensive field surveys and herbarium works has resulted in the discovery of four new records of *Psychotria* for Thailand (Srisuk *et al.*, 2020) and here, after careful investigations based on specimens from additional field surveys and herbaria, one new record, *P. laui* Merr. & F.P.Metcalf, and one new species, have been discovered and the latter is described here as *P. oxyalabastron* T.Srisuk & Chamch. *sp. nov.*

TAXONOMIC TREATMENT

NEW SPECIES

Psychotria oxyalabastron T.Srisuk & Chamch., **sp. nov.**

Psychotria oxyalabastron is similar to *P. cambodiana* Pierre ex Pit. in having tomentose, puberulous or pilose indumentum on branches and

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the lower leaf surface (at least on the venation), bifid or bilobed stipules, elliptic or oblanceolate laminas, loose corymbose-like thyrsiform inflorescences, and glabrous floral buds. However, it differs from *P. cambodiana* in the glabrous upper leaf surface (vs pilose), glabrous on intercostal areas on the lower leaf surface (vs pilose), acute floral bud apex with corolla protrusion (vs rounded floral bud apex without corolla protrusion), shorter corolla tube 1.3–1.4 mm long (vs 2–2.3 mm long), and the glabrous to sparsely puberulent ovary (vs tomentose or pilose).

Type: Thailand. Nakhon Si Thammarat: Khao Luang National Park, elevation 750 m, 24 Jan. 1966, *Hansen & Smitinand 12045* (holotype **BKF** [SN054277!], isotypes **BKF** [SN113982!], **E** [E00873336!], **K** [K001273847!], **L** [L.2948098!, L.2948100!], **SING!**). Fig. 1.

Erect shrubs, 1–1.5 m tall; branches densely tomentose, puberulous or pilose, longitudinal ridges absent. *Stipules* ovate-lanceolate, 4–5.9 × 3.4–5 mm, bilobed, lobes triangular or lanceolate, outside densely tomentose, inside pubescent with hairs and colleters at the base, apex acuminate, margin entire, ciliate with pilose hairs, caducous. *Leaves* opposite; blades elliptic, oblong or rarely oblanceolate, 5.2–12.8 × 2–4.5 cm, sub-chartaceous; upper surface glabrous, drying bright reddish-brown; lower surface glabrous on the intercostal area and puberulous along veins, drying bright reddish-brown; apex acuminate; margin entire; base cuneate or cuneate-attenuate; lateral veins 9–11 pairs, brochidodromous without collector veins; domatia absent; petioles 0.6–2.5 cm long, puberulous or tomentose. *Inflorescences* terminal, loose corymbose-like thyrse, 0.7–1.6 cm long, trichotomous; primary branches 2, opposite; flowers in inflorescence unit (1–)3, lax; peduncle absent; bracts and bracteoles caducous, lanceolate, 0.4–1.2 × 0.7–1 mm, glabrous above, glabrous or sparsely tomentose beneath, apex acuminate, margin lobed, with scabrous-ciliate hairs; leaf-like bracts absent; inter floral space sparsely scabrous or puberulent. *Flowers* 5-merous; pedicels 0.9–1.2 mm long, elongated to 1.5–2.2 mm long when fruiting, glabrous or sparsely scabrous; floral buds obovoid, apex acute, glabrous, corolla protrusion present. *Calyx* campanulate; tube 0.3–0.5 mm long, glabrous on both sides; lobes triangular, 0.4–1 × 0.4–0.7 mm, glabrous on both surfaces, apex attenuate-acute or acuminate, margin entire, with scabrous-ciliate hairs. *Corolla* short salverform, white; tube 1.3–1.4 mm long, outside glabrous, inside villous at throat; lobes ovate or ovate-lanceolate, 1.5–1.7 × 0.8–1 mm, upper surface papillose, lower surface glabrous, apex acute, reflexed, margin entire with papillose-ciliate hairs. *Stamens* exerted from corolla; filaments 0.1–0.2 mm long, glabrous; anthers basifixed, ovate-oblong, 0.8–0.9 × 0.5–0.6 mm, apex rounded, glabrous. *Ovary* glabrous to sparsely puberulent; style 2.6–2.8 mm long, glabrous; stigma 2-lobed, lobes obovate, papillose. *Infructescences* 1.7–2.2 cm long, rachis densely puberulous, pedicels glabrous or sparsely scabrous. *Drupes* globoid or ellipsoid-globoid, 5.5–7.2 mm long, 4.5–5.6 mm in diam., entire, glabrous, calyx lobes persistent; pyrene plano-convex, hemigloboid or hemiellipsoid-hemigloboid, bony, 5–5.5 × 3.4–4.4 mm, dorsal side convex, wrinkled, 4-ridged; ridges longitudinal protruding, ventral side flat, with a longitudinal median crest; preform germination slits absent. *Seed* plano-convex, hemigloboid or hemiellipsoid, 4.6–4.8 × 1.4–1.5 mm, dorsal side convex, smooth, 4-ridged; ridges longitudinal protruding, ventral side flat, with a conspicuous thin raised median ridge; endosperm ruminate.

Thailand.— PENINSULAR: Surat Thani [Ban Kaup Kep, ca 100 m alt., 8 Aug. 1927, *Kerr 13202* (**BK!**, **BM!**, **K!**)]; Krabi [Phanom Bencha, ca 800 m alt., 29 Mar. 1930, *Kerr 18746* (**K!**)]; Nakhon Si Thammarat [Khao Luang National Park, 750 m alt., 24 Jan. 1966, *Hansen & Smitinand 12045* (**BKF!**, **E!**, **K!**, **L!**, **SING!**); ibid., 950–1,100 m alt., 20 Jan. 1966, *Tagawa et al. T-4711* (**BKF!**, **E!**); ibid., ca 750–950 m alt., 22 May 1968, *van Beusekom & Phengkhlai 925* (**AAU!** -2 sheets, **BKF!**, **E!**, **K!**, **L!**, **P!**); Lansaka, 600 m alt., 30 Oct. 1957, *Bunnak 748* (**BKF!**)]; Yala [Than To, 200 m alt., 31 Oct. 2001, *Pooma et al. 3175* (**BKF!**)].

Distribution.— Endemic.

Ecology.— Shaded area in tropical evergreen rainforest, dry evergreen forest and lower montane rainforest with granite bedrock; 100–1,100 m alt. Flowering: January–March; fruiting: January–October.

Vernacular.— Pha hom dong (พาโหมดง) (proposed here).

Etymology.— The specific epithet '*oxyalabastron*' refers to the acute shape of the floral bud, and is modified from the Greek "*oxy*-" for acute, combined with "*alabastrum*" for floral bud (*alabastron* = adjective form).

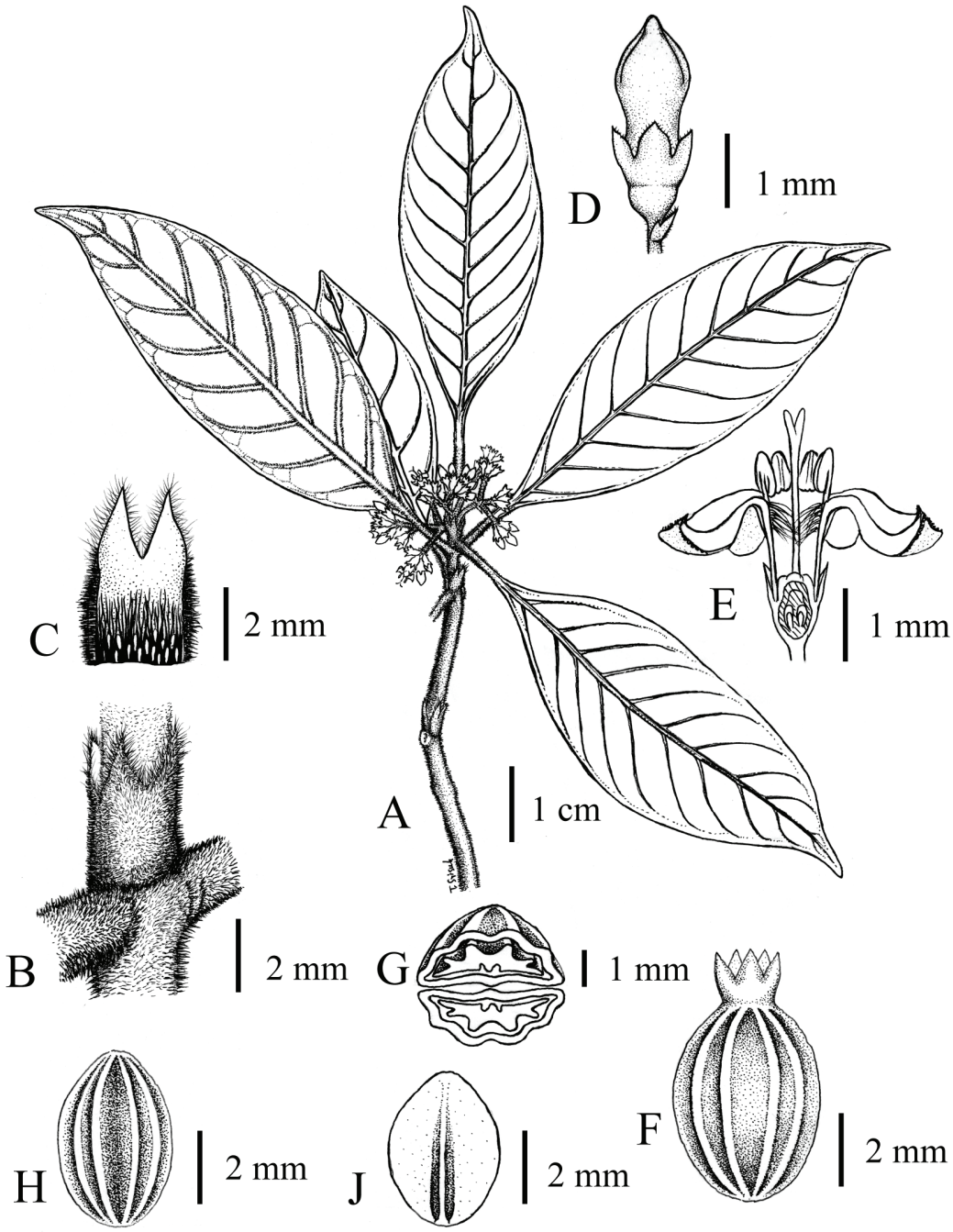

Figure 1. *Psychotria oxyalabastron* T.Srisuk & Chamch.: A. flowering branch; B. stipules, outer surface; C. stipules, inner surface with hairs and colleters; D. floral bud; E. flower, dissection; F. pyrene, side view; G. pyrene, cross section; H. seed, dorsal view; J. seed, ventral view. Materials A.–E. from *Hansen & Smitinand 12045* (**E**); F.–J. from *van Beusekom & Phengklai 925* (**K**). Drawn by T. Srisuk.

Preliminary conservation status.— *Psychotria oxyalabastron* is known from eight localities in Peninsular Thailand. Five subpopulations are located in Khao Luang National Park (Nakhon Si Thammarat), one in Khao Phanom Bencha National Park (Krabi), one in Than To (Yala) and one outside the protected area (Ban Kaup Kep, Surat Thani). GeoCAT (Bachman *et al.*, 2011) was applied to assess the Extent of Occurrence (EOO) as 505.651 km^2 and the Area of Occupancy (AOO) as 24 km^2 (using the IUCN default cell width as 2 km). The habitat quality of subpopulations from Than To and Ban Kaup Kep tend to decrease because of primary forest loss problem. In addition, the small number of subpopulations in protected areas tend to experience fluctuations due to habitat fragmentation, which has led to population decline. Therefore, based on IUCN Red List Criteria B (IUCN, 2012), *Psychotria oxyalabastron* is here assigned as Endangered (EN): B1a+b(iii)+c(ii), B2a+b(iii)+c(ii).

Notes.— *Psychotria oxyalabastron* is only found in Peninsular Thailand and most similar to *P. cambodiana* that found in Southeastern Thailand, however it also resembles *P. langbianensis* Wernham and *P. rudis* Ridl. which are also found in Peninsular Thailand by having tomentose, puberulous or pilose indumentum on branches and the lower leaf surface (at least on veins), bifid or bilobed stipules, elliptic or related elliptic leaf shapes, and loose thyrsiform inflorescences. It is distinguished from these two species by its glabrous intercostal area on the lower leaf surface (vs densely tomentose to pilose throughout lower leaf surface in *P. langbianensis* and *P. rudis*), acute floral bud apex with corolla protrusion (vs rounded and without corolla protrusion), shorter corolla tube (1.3–1.4 mm long vs 2.9–3 mm long in *P. langbianensis*, 1.7–2.5 mm long in *P. rudis*), and glabrous lower surface of corolla lobes (vs scabrous in *P. langbianensis*, papillose near apex in *P. rudis*). Moreover, *P. oxyalabastron* differs from *P. langbianensis* by its glabrous outer surface of calyx lobes and glabrous on the outside of the corolla tube (pilose in *P. langbianensis*).

NEW RECORD

Psychotria laui Merr. & F.P.Metcalf, Lingnan Sci. J. 16(3): 403. 1937.; Chen & Taylor, Fl. China 19: 298. 2011.— *Cephaelis laui* (Merr. & F.P.Metcalf) F.C.How & W.C.Ko, Fl. Hainan. 3: 578. 1974. Type: China. Hainan: Ka Chick Shan, Chang Kiang District, 6 Jan. 1934, *Lau 3083* (lectotype **IBSC** [IBSC0005805], designated by Turner (2019), photo seen); isolectotypes **A** [A00095295] photo seen, **A** [A00095296] photo seen, **P** [P00753704!], **SYS** [SYS00096120], photo seen). Fig. 2.

— *Cephaelis lecomtei* Pit. in Lecomte, Fl. Indo-Chine 3: 370. 1924; P.H.Hô, Cây Co Viêtnam 3(1): 247. 1993. Type: Vietnam. Annam: Ben-tram, prov. de Quang-tri, 8 Mar. 1920, *Poilane 1077* (lectotype **P** [P04008122!], designated by Turner (2019); isolectotypes **K** [K001273771!], **P** [P00604147!], **P** [P04008121!]).

Erect shrubs, 0.8–2 m tall; branches glabrous, longitudinal ridges present. *Stipules* sheathing, ovate-lanceolate or triangular, 1.3–3 × 2.3–2.8 mm, apex acuminate or caudate-acuminate, margin entire, outside glabrous, inside pubescent with hairs and colletors at base, caducous. *Leaves* opposite; blades elliptic, elliptic-obovate or obovate, 7.2–10.7 × 2.9–4.2 cm, coriaceous or sub-coriaceous; glabrous on both surfaces, drying reddish-brown or greyish-brown on both surfaces; apex acuminate; margin entire; base attenuate or attenuate-cuneate; lateral veins 7–8 pairs, brochidodromous without collector veins; tertiary venation inconspicuous when dried, domatia absent; petioles 0.7–1.2 cm long, glabrous. *Inflorescences* terminal or pseudo-axillary, dense head-like thyrse, 0.8–3.1 cm long, monochotomous, dichotomous to trichotomous; primary branches 1–3, opposite, glabrous; flowers in inflorescence unit 3–5, dense; peduncle 1.7–2.1 cm long, elongate to 2–3.6 cm long when fruiting, glabrous; bracts and bracteoles persistent, lanceolate or ovate, 4–5.6 × 1.3–4.1 mm, apex acute to acuminate, margin lobed with pilose-ciliate hairs, glabrous on both sides; leaf-like bracts present; inter floral space glabrous. *Flowers* 5–6-merous, sessile or sub-sessile; floral buds spherical, apex rounded, glabrous, corolla protrusion absent. *Calyx* tubular; tube 0.8–1 mm long, glabrous on both sides; lobes ovate, 1–1.5 × 0.5–0.8 mm, apex acuminate, margin entire or entire with pilose-ciliate hairs, outside sparsely pilose near apex, inside glabrous. *Corolla* short campanulate, white; tube 1.7–1.9 mm long, outside glabrous, inside densely villous at throat; lobes elliptic-oblong, 1–1.2 × 0.4–0.5 mm, apex acute, reflexed, margin entire with sparsely scabrous-ciliate hairs, upper surface glabrous, lower surface scabrous. *Stamens* exerted from corolla;

filaments 0.3–0.4 mm long, glabrous; anthers dorsifixed, elliptic, 0.8–1 × 0.3–0.5 mm, apex rounded, glabrous. *Ovary* glabrous; style 1.3–1.5 mm long, densely papillose; stigma 2-lobed, lobes elliptic, glabrous. *Infructescences* 3–4.9 cm long, glabrous. *Drupes* ellipsoid or ellipsoid-ovoid, entire, glabrous, calyx lobes persistent; pyrene plano-convex, hemiovoid or hemiellipsoid, bony, 6–7.2 × 4.3–5.2 mm, dorsal side convex, smooth, 4-ridged; ridges longitudinal protruding, ventral side flat, with inconspicuous longitudinal grooves; preform germination slits absent. *Seeds* plano-convex, hemiellipsoid, 5.2–6.5 × 3.5–4.2 mm, dorsal side convex, smooth, 4-ridged; ridges longitudinal protruding, ventral side flat, with 2 conspicuous longitudinal grooves; endosperm ruminate.

Figure 2. *Psychotria laui* Merr. & F.P. Metcalf: A. habit; B. branch with flowers & inflorescence; C. branches with fruits. Photos by T. Srisuk.

Thailand.— SOUTH-EASTERN: Chanthaburi [Khao Soi Dao, ca 408 m alt., 10 Nov. 1969, *van Beusekom & Smitinand 2086* (**AAU!**, **E!**, **K!**, **L!**, **P!**); Khao Soi Dao Wildlife Sanctuary, Khao Soi Dao Waterfalls, 300 m alt., 29 June 2001, *Chamchumroon & Puff V.C.1104* (**BKF!**); Makham: Khao Soi Dao Wildlife Sanctuary, 1 Sept. 2015, *Srisuk 957* (**KKU!**); Pong Nam Ron, Khao Soi Dao Wildlife Sanctuary, Khao Soi Dao North, 300–800 m alt., 26 Nov. 1979, *Shimizu et al. T-23635* (**BKF!**, **L!**); ibid., 23 Jan. 1956, *Smitinand 3244* (**BKF!**); Namtok Phlio National Park, 8 Sept. 1994, *Boyce 902* (**K!**)].

Distribution.— China (Hainan), Vietnam.

Ecology.— Shaded or open areas in dry evergreen forest and lower montane rain forest, 300–1,650 m alt. Flowering: March–June; fruiting: May–September.

Vernacular.— Saming kham ram chanthabun (สมิงคำรามจันทบูร)(proposed here).

Preliminary conservation status.— *Psychotria laui* was originally described based on the specimens from China (Hainan), while this species was also known in Vietnam (Quang tri, Massive du Langbian, Thua Luu, Massif du Braïan près de Djiring, Phu hu, Phan Rang, Saigon, Bienhoa) under name of *Cephaelis lecomtei* Pit., and now its distribution area is extended to Thailand (Chanthaburi). We coordinated these locations based on herbarium labels and relevant publications, and the extent of occurrence (EOO) and area of occupancy (AOO) were calculated as 426,993.596 km^2 and 72 km^2, respectively, based on IUCN auto value cell width (2 km grid) using GeoCAT (Bachman *et al.*, 2011).

According to the herbarium database, this species has been recorded from Hainan, the Annam Ranges, and Eastern Thailand. While the estimated Extent of Occurrence (EOO) for the species exceeds 20,000 km², only a few recorded habitats are located within conservation areas, such as Langbian (Vietnam), Khao Soi Dao Wildlife Sanctuary, and Namtok Phlio National Park (Thailand). An assessment of primary forest loss between 2002 and 2022, conducted by the University of Maryland and the World Resources Institute (2024), reveals that primary forests have been lost in several regions, including 62.9 km² in Hainan, 116 km² in Quảng Trị, 7.5 km² in Phú Lộc (Thua Thien-Hue), 24.6 km² in Djiring (Di Linh), and 0.32 km² in Saigon (Ho Chi Minh City). Moreover, recent habitats such as Phu Hu, Phan Rang, and Bien Hoa have been increasingly converted into agricultural and urbanized areas. Therefore, it is assigned a status of Vulnerable: VU, B1a+b(iii)+c(ii), B2a+b(iii)+c(ii) based on IUCN Red List Criteria B (IUCN, 2012).

Notes.— *Psychotria laui* resembles *P. monticola* Kurz from Bangladesh, East Himalaya, India (the Andaman Islands and Assam), Malaya, Myanmar, Thailand and Vietnam in having leaves without domatia, a head-like inflorescence, corolla tube glabrous on the outer surface, and glabrous ovary. However, *P. laui* is distinguished from *P. monticola* by its presence of longitudinal ridges on branches (vs entirely terete in *P. monticola*), undivided stipules with acuminate or caudate-acuminate apex (vs stipules divided with two acuminate apex), and shorter campanulate corolla tube 1.7–1.9 mm long (vs corolla tube short salverform, 3.4–4.9 mm long).

Psychotria laui was previously recorded in China and Vietnam (Merrill & Metcalf, 1937; Chen & Taylor, 2011; Turner, 2019). After our recent field surveys in Thailand and herbarium investigations, there were several specimens collected from Chanthaburi Province in Southeastern Thailand that morphologically differed from other species of *Psychotria* in Thailand. After we compared these specimens with the specimens from other regions and countries, it was found that it was similar to the specimen *Lau 3083* kept at **P** (P00753704), which is the isolectotype of *P. laui*. Moreover, the morphological characters are matched well with the protologue as well as relevant specimens and literature (Merrill & Metcalf, 1937; Chen & Taylor, 2011; Turner, 2019). Therefore, we identify these specimens as *P. laui* and extend its distribution to SE Thailand. However, when compared to the species description from Flora of China (Chen & Taylor, 2011), there is slight differences: the outermost bracts connate into a cupuliform involucre, whereas the bract of Thai specimens is lanceolate. We found that this character is variable, for example, in the isolectotypes (*Lau 3083*) both cupuliform and lanceolate shapes can be found.

Psychotria laui was first described from Hainan by Merrill & Metcalf (1937) and transferred to *Cephaelis* by How & Ko (1974), while *Cephaelis lecomtei* was described from Vietnam by Pitard (1924). *Psychotria laui* is a heterotypic synonym of

C. lecomtei and the name *C. lecomtei* has nomenclatural priority. Based on morphology, the species has short straight corolla tube, pyrenous seed and ruminate endosperm which are the diagnostic characters of the genus *Psychotria* thus *C. lecomtei* should be transferred to *Psychotria* but the name *P. lecomtei* is unavailable for the new combination of *C. lecomtei* because there was another species from Vietnam had been described as *P. lecomtei* by Pitard (1924). Therefore, *P. laui*, which was the second priority of legitimate name, was selected by Turner (2019) to substitute for a new combination of *C. lecomtei* in conformity with ICN Art. 11.4 Ex. 17 (Turland *et al.*, 2018).

Specimens examined.— China. Hainan [Chang Kiang, Ka Chik Shan and vicinity, 6 June 1934, *Lau 3038* (**P!**); Chang Kiang, Lok Mooi Shan and vicinity, 26 Feb. 1933, *Lau 1203* (**P!**); Hainan, 11 Dec. 1933, *Liang 66101* (**K!**, **P!**)]. Vietnam. Annam [Quang tri, 8 Mar. 1920, *Poilane 1077* (**K!**, **P!** (3 sheets)); ibid., 28 Dec. 1931, *Poilane 19981* (**P!**); ibid., *Schmidt 792* (**P!**); Massive du Langbian, 1 May 1919, *Chevalier 40463* (**P!**); Thua Luu, 1911, *Lecomte & Finet 1312* (**P!**); Massif du Braïan près de Djiring, 17 Jan. 1935, *Poilane 23944* (**P!**); Phu Hu prov., Nhatrang, 19 Jan. 1923, *Poilane 5380* (**P!**); Phan Rang, 24 Nov. 1923, *Poilane 8720* (**P!**)]; Cochinchina [Saigon, *Poilane 12474* (**P!**); Bienhoa, 26 Oct. 1932, *Poilane 21252* (**P!**), *21272* (**P!**)]

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