

An annotated checklist of the genus *Pseuderanthemum* Radlk. (Acanthaceae) in Thailand

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ABSTRACT

A checklist of the genus *Pseuderanthemum* in Thailand is presented, including ecological data, distributional information and specimen citations. Sixteen taxa are recognized, of which 11 taxa are native and five are introduced, including two new species; *Pseuderanthemum thailandicum* T.Choopan & P.J.Grote and *P. lanceophyllum* T.Choopan. A key to the species is also given. Lectotypes for 5 names are also designated.

KEYWORDS: Acanthaceae, *Pseuderanthemum*, taxonomy, Thailand.

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INTRODUCTION

The genus *Pseuderanthemum* Radlk. (subfamily Acanthoideae, tribe Ruellieae, subtribe Justiciinae) consists of approximately 60 species of herbs and shrubs (Scotland & Vollesen, 2000). The genus is distributed mainly in tropical regions and is well represented in tropical Africa and tropical Asia. Several species are ornamental plants, such as *Pseuderanthemum carruthersii* (Seem.) Guillaumin and *P. reticulatum* (W.Bull) Radlk., which are introduced and widely cultivated in Thailand.

The delimitation of Thai *Pseuderanthemum* species, their geographical distribution and their economic importance are little known. Craib (1912) described four Thai species under *Eranthemum* T.Anderson (a superfluous name – see generic citation below). Imlay (1939) listed six Thai species of *Pseuderanthemum* and more recently, Hansen (1989) worked on South-East Asian Acanthaceae proposing two new combinations, including the Thai species *P. latifolium* (Vahl) B.Hansen and synonymizing *Antheliacanthus* Ridl. under *Pseuderanthemum*. Based on the classification of Bremekamp (1965), Chaikong (2001) researched the taxonomy of

subtribe Barleriinae in north-eastern Thailand, providing keys to the genera and species and, for *Pseuderanthemum*, descriptions of eight species, including two previously unidentified taxa. Based on the revised study of this genus throughout Thailand (Choopan, 2013), the list of *Pseuderanthemum* species has been further revised (Pooma & Suddee, 2014), and these are documented here, together with their ecology and distribution.

MATERIALS AND METHODS

The genus *Pseuderanthemum* has been treated for the Flora of Thailand based on examination of specimens from Thailand at the following herbaria: AAU, ABD, BK, BKF, BM, C, E, K, KKU, L, P and QBG (Thiers, continuously updated) and digitized specimen images available on JSTOR Global Plants (<http://plants.jstor.org/>). Field collection and flowering period observations were made throughout Thailand. Collected specimens were deposited in BK, BKF and the herbarium of Suranaree University of Technology. Morphological and taxonomic investigations were made from living specimens from the natural habitat or herbarium specimens. Herbarium specimens were

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examined using a binocular microscope. Sixteen taxa are recognized, including cultivated species listed in a separate section. Distribution maps of native species are provided (Figs. 1–3). Some areas in Thailand that have herbarium collections were not visited, whilst some field areas are new records and/or observations for the study group, hence separate maps for observations from field collections or herbarium specimen citation are given; in addition, a key to the species is provided.

TAXONOMIC TREATMENT

PSEUDERANTHEMUM

Radlk. [Sitzungsber. Math.-Phys. Cl.Königl. Bayer. Akad. Wiss. München 13: 282. 1883, **nom. nud.**] ex Lindau in Engl. & Prantl, Nat. Pflanzenfam. 4(3b): 330. 1895; Ridl., Fl. Malay Penin. 2: 588. 1923; Benoist in Lecomte, Fl. Indo-Chine. 4: 716. 1935; Leonard, Contr. US Natl. Herb. 31: 729. 1958; Scotland & Vollesen, Kew Bull. 55(3): 587. 2000; Y.F.Deng *et al.*, Fl. Hong Kong 3: 177.2009; Vollesen in Darbyshire *et al.*, Fl. Trop. East Africa 478. 2010; C.C.Hu *et al.* in C.Y.Wu *et al.*, Fl. China 19: 439. 2011. Type: *Pseuderanthemum bicolor* (Schrank) Radlk., lectotype chosen by Leonard (1958).

— *Eranthemum* T.Anderson, J. Linn. Soc. Bot. 9: 446. 1867, **nom. illeg.**, non L. (1753).

— *Antheliacanthus* Ridl., J. Fed. Malay States Mus. 10: 109. 1920. Type: *Antheliacanthus micranthus* Ridl.

— *Buceragenia* Greenm., Proc. Amer. Acad. Arts 32: 303. 1897. Type: *Buceragenia minutiflora* Greenm.

— *Chrestienia* Montrouz. in Beauvis., Ann. Soc. Bot. Lyon 26: 88. 1901. **nom. inval.** Type: *Chrestienia* Montrouz.

— *Pigafetta* Adans., Fam. Pl. 2: 223. 1763. **nom. rej.**, non Blume (1826).

Herbs or shrubs. *Leaves* simple, opposite, with cystoliths, petiolate; leaf blade margin entire or obtusely toothed; leaf venation opposite or alternate. *Inflorescences* terminal or axillary thyrses; bracts and bracteoles often small, linear; flowers opposite, zygomorphic to nearly actinomorphic, sessile or with short pedicel. *Calyx* synsepalous, deeply divided into 5 linear, equal segments. *Corolla* sympetalous, tube slender, narrowly cylindrical, slightly dilated at throat; limb spreading, 5-lobed; lobes ascending cochlear, abaxial one slightly larger, white or purple or pink. *Stamens* 2, inserted at throat, included or exserted; filaments very short; anthers 2-celled, cells equal, parallel and at equal level, without appendages at base, longitudinally dehiscent, staminodes 2 or absent, pollen 3-colporate. *Ovary* with 2 ovules per cell; stigma 2-lobed. *Capsule* clavate, with 2 seeds per locule, basally contracted into a sterile stalk (or stipe), constricted between the seeds, retinacula well-developed. *Seeds* 2–4, flat, ovoid in face view, surface corrugated.

The genus *Pseuderanthemum* consists of approximately 60 species of herbs and shrubs. Sixteen species are known from Thailand. Five species are introduced as cultivated ornamental and medicinal plants. Eleven species are native to Thailand.

KEY TO THE SPECIES

1. Leaves linear to narrowly oblong, < 0.5 cm wide **1. *P. axillare***
1. Leaves lanceolate or elliptic to ovate, > 0.5 cm wide
 2. Leaves thick and very brittle, glabrous
 3. Inflorescence > 15 cm long; flowers distantly arranged, corolla tube > 2 cm long; leaves usually symmetric
 4. Leaves green underneath, normally with paler green band along veins on upper surface, ovate; ovary puberulous on the top **6. *P. latifolium***
 4. Leaves normally reddish purple underneath, without paler green band along veins on upper surface, lanceolate to ovate; ovary glabrous **11. *P. thailandicum***
 3. Inflorescences < 15 cm long; flowers densely arranged, corolla tube ≤ 1.5 cm long; leaves often asymmetric
 5. Corolla and style white; stem pale brown
 6. Leaves yellowish or whitish green, ovate or elliptic, length:width ratio ca 2:1 **15. *P. reticulatum***
 6. Leaves purplish grey or silver-purple, narrowly lanceolate, length:width ratio ca 3:1 **14. *P. metallicum***
 5. Corolla and style reddish purple; stem dark purple **12. *P. carruthersii***
 2. Leaves thin and very brittle, glabrous or pubescent
 7. One or more corolla lobes dark purple-dotted
 8. Corolla white, dark purple-dotted on all 5 lobes, bracts leaf-like **2. *P. bracteatum***
 8. Corolla purple, dark purple-dotted on lower-lobes only or on all 5 lobes, bracts linear

9. Only 1–3 lower corolla lobes dark purple-dotted, leaves glabrous
 10. Corolla purple-dotted only on middle lower lobe, usually in three lines at base; red veins on underside of leaves present; inflorescences ≤ 10 cm long, unbranched **10. *P. siamense***
 10. Corolla purple-dotted on one to three lower lobes, but not in lines on middle lobe; red veins on underside of leaves absent; inflorescences > 10 cm long, branched **7. *P. longistylum***
 9. All 5 corolla lobes dark purple-dotted, leaves pubescent **9. *P. pubescens***
 7. Corolla lobes not dark purple-dotted
 11. Stamens exserted; flowers zygomorphic
 12. Corolla white; leaves brown-puberulous **16. *P. lanceophyllum***
 12. Corolla purple; leaves glabrous
 13. Margin of corolla lobes wavy
 14. Flowers normally in whorls; secondary veins of leaves purple **4. *P. glomeratum***
 14. Flowers opposite; secondary veins of leaves not purple **8. *P. parishii***
 13. Margin of corolla lobes not wavy
 15. Corolla tube funnel-shaped; base of middle lower lobe not swollen **13. *P. laxiflorum***
 15. Corolla tube salverform; base of middle lower lobe swollen, tongue-like **5. *P. graciliflorum***
 11. Stamens inserted; flowers nearly actinomorphic **3. *P. crenulatum***

1. *Pseuderanthemum axillare* J.B. Imlay, Bull. Misc. Inform. Kew 1939 (3): 132. 1939. Type: Thailand, Nakhon Ratchasima, Sikhio, in bamboo scrub, alt. 200 m, 21 Jan. 1931, *Kerr 19909* (lectotype **BK** [SN257627!], designated by Imlay (1939); isolectotypes **ABD** [ABDUH:2/865!], **BM** [BM00950115!], **K** [K000885593!], K000885594!)).

Thailand.— EASTERN: Nakhon Ratchasima [Sikhio, 21 Jan. 1931, *Kerr 19909* (**ABD**, **BK**, **BM**, **K**); Sikhio, 23 Dec. 1923, *Kerr 8095* (**BK**, **BM**, **K**); Ubon Ratchathani [Pha Taem NP, 22 Dec. 2010, *Chooapan 2010-086* (**BKF**)]. Fig. 1A.

Distribution.— Endemic.

Ecology.— In shaded mixed deciduous forest with bamboo, dry dipterocarp forest, sandy soil, 100–500 m alt.

Phenology.— Flowering in December–January.

Vernacular.— Khem bai khaep (เข็มใบแคบ), khem pha taem (เข็มผาแต่ม).

Notes.— This species is distinguished from other taxa by its long slender, linear to narrowly elliptic or narrowly lanceolate leaves, subsessile axillary flowers, and the corolla lobes being crenulate at the apex.

2. *Pseuderanthemum bracteatum* J.B. Imlay, Bull. Misc. Inform. Kew 1939(3): 133. 1939; P.H. Hô, *Câyco Vietnam*. 3(1): 76. 1993. Type: Thailand, Nakhon Sawan, Takhli, alt. 200 m, 26 Nov. 1928, *Put 2113* (lectotype **BK** [SN257628!], designated by Imlay (1939); isolectotypes **ABD** [ABDUH:2/866!], **ABDUH**:2/867!, **BM** [BM00950114!], **K** [K000885592!]).

Thailand.— NORTHERN: Sukhothai [Mueang Kao, 9 Mar. 1972, *Maxwell 72-80* (**AAU**, **BK**, **L**)]; Nakhon Sawan [Takhli, 26 Nov. 1928, *Put 2113* (**ABD** 2 sheets, **BK**, **BM**, **K**)]; NORTH-EASTERN: Sakon Nakhon [Phu Phan, 25 Feb. 1993, *Chantaranothai et al.* 932 (**K**); *ibid.* 15 Feb. 2000, *Chaikong 19/43* (**KKU**)]; Khon Kaen [Pha Nok Khao, 22 Feb. 1958, *Suvarnakoses 1355* (**BKF**, **K**)]; EASTERN: Chaiyaphum [Chaung Sam Mao, 31 Jan. 1931, *Kerr 19976* (**BK**, **BM**, **K**)]; Si Sa Ket [Phumisarol, 15 Mar. 1967, *Phusomsaeng s.n.* (**BKF**, **L**)]; Khao Phra Vihan NP, 21 Dec. 2005, *Pooma et al.* 6022 (**BKF**); *ibid.*, 25 Nov. 2005, *Suddee et al.* 2621 (**BKF**)]; CENTRAL: Lop Buri [Lam Narai, 5 Apr. 1975, *Smitinand 12040* (**BKF**)]; Saraburi [Muak Lek, 15 Dec. 1990, *Larsen et al.* 41997 (**AAU**)]. Fig. 1B.

Distribution.— Laos, Vietnam.

Ecology.— In shaded mixed deciduous forest with bamboo, dry dipterocarp forest, dry evergreen forest, sandy soil, 150–400 m alt.

Phenology.— Flowering in January–February.

Vernacular.— Khem bai pradap (เข็มใบประดับ).

Notes.— This species is distinguished from other species in the genus by the very conspicuous leaf-like bracts, long dentate calyx, and two distinctly separated adaxial corolla lobes.

3. *Pseuderanthemum crenulatum* (Wall. ex Lindl.) Radlk., Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München 13: 282. 1883; Ridl., Fl. Malay Penin. 2: 589. 1923; Benoist in Lecomte, Fl. Indo-Chine 4: 720. 1935; C.C. Hu *et al.* in C.Y. Wu *et al.*, Fl. China 19: 439. 2011.— *Eranthemum crenulatum*

Wall. ex Lindl., Bot. Reg. 11: 879. 1825; Nees in A.DC., Prodr. 11: 453.1847; T.Anderson, J. Linn. Soc. Bot. 9: 523. 1867; C.B.Clarke in Hook.f., Fl. Brit. India 4: 497. 1885 & in Rosenv., Bot. Tidsskr. 24: 349. 1902b. Type: Figure in Bot. Reg. 11: t. 879. 1825 (lectotype, selected here).

— *Eranthemum crenulatum* Wall. ex Nees, in Wall., Pl. Asiat. Rar. 3: 107.1832, **nom. illeg.**

— *Pseuderanthemum crenulatum* (Wall. ex Lindl.) Radlk. var. *ecorticatum* J.B.Imlay, Bull. Misc. Inform. Kew 1939 (3): 135. 1939. Type: Thailand, Chumphon, Ta Ngao, 17 Jan. 1927, *Kerr 11491* (lectotype **BK** [SN232040!], designated by Imlay (1939); isolectotype **ABD** [ABDUH:2/868!], **BM** [BM00950113!]).

— *Pseuderanthemum crenulatum* (Wall. ex Lindl.) Radlk. var. *glabrum* J.B.Imlay, Bull. Misc. Inform. Kew 1939(3): 136. 1939. Type: Thailand, Phangnga, Nop Pring, 11 Mar. 1930, *Kerr 19367* (lectotype **ABD** [ABDUH:2/869!], designated by Imlay (1939)).

Thailand.— PENINSULAR: Chumphon [Ta Ngao, 17 Jan. 1927, *Kerr 11491* (**ABD**, **BK**, **BM**); Tasan, 22 Dec. 1928, *Kerr 16271* (**BK**, **BM**); Khao Din, 30 Dec. 1973, *Sutheesorn 2749* (**BK**); Ranong [Kaper, 7 Dec. 1979, *Shimizu et al.* 26352 (**BKF** 2 sheets, **L**) & 26379 (**BKF**, **L**); Khao Phota Luangkao, 11 Dec. 1979, *Shimizu et al.* 27002 (**L**), 27024 (**BKF** 2 sheets, **L**) & 27045 (**BKF**); Surat Thani [Sanyao, 22 Feb. 1930, *Kerr 18192* (**BK**, **BM**); *ibid.*, 23 Feb. 1930, *Kerr 18215* (**BK**, **BM**, **C**, **K**, **L**); Khao Sok, Phanom, 12 Dec. 1979, *Shimizu et al.* 27071 (**BKF**, **L**) & 27078 (**BKF** 2 sheets, **L**); *ibid.*, 2 Mar. 1983, *Koyama et al.* 33953 (**BKF**); Phangnga [Thapput, 5 Mar. 1930, *Kerr 18363* (**BM**, **L**) & 19355 (**K**); Nop Pring, 11 Mar. 1930, *Kerr 19367* (**ABD**); Suwan Khuha cave, Mueang, 15 Dec. 1979, *Shimizu et al.* 27354 (**BKF** 2 sheets, **C**, **L** 2 sheets) & 27376 (**BKF**, **L**); Ko Song, Similan NP, 25 Nov. 1992, *Niyomdham & Puujaa 3308* (**BKF**); Ko Paet, Similan NP, 28 Nov. 1992, *Niyomdham & Puujaa 3355* (**BKF**); Phuket [Nai Han beach, 14 Dec. 1979, *Shimizu et al.* 27292 (**BKF** 2 sheets, **L**); Nai Thon beach, 24 Dec. 1976, *Kerr 34* (**AAU**); Krabi [Ao Luk, 8 Oct. 1970, *Charoenphol et al.* 3450 (**AAU**, **BKF**, **L**); Phiphi Island, 9 Apr. 1930, *Kerr 18903* (**BK**, **BM**, **C**, **K**, **L**); Nai Chong, 19 Jan. 1966, *Hansen & Smitinand 12013* (**C**, **L**); *ibid.*, 20 Jan. 1966, *Hansen & Smitinand 12026* (**C**, **E**); *ibid.*, 11 Feb. 1966, *Hansen*

& *Smitinand 12227* (**BKF**, **L**); Than Bokhorani, 16 Dec. 1979, *Shimizu et al.* 27399 (**AAU**, **BKF** 3 sheets, **C**, **K**, **L** 2 sheets) & 27405 (**BKF** 2 sheets, **L**); Nakhon Si Thammarat [Thung Song, 18 Feb. 1929, *Put 2366* (var. *glabrum* **BK**, **BM**, **K**); Khao Luang, 3 Feb. 1966, *Hennipman 3822* (**BKF**, **C**, **K**); *ibid.*, 5 Nov. 1951, *Smitinand 1039* (**BKF**); *ibid.*, 25 Jan. 1966, *Hansen & Smitinand 12057* (**BKF**, **C**); *ibid.*, 5 Mar. 1983, *Koyama et al.* 34048 (**BKF**, **L**); *ibid.*, 24 Jan. 1966, *Sutheesorn 870* (**BK**); *ibid.*, 22 Nov. 1951, *Suvarnakoses 152* (**BKF**); Krung Ching waterfall, Tha Sala, 2 Mar. 1986, *Maxwell 86-128* (**BKF**, **L**); *ibid.*, 21 Feb. 1991, *Niyomdham 2247* (**BKF** 2 sheets); Lansaka, 24 Nov. 1984, *Maxwell 84-480* (**BKF**); *ibid.*, Feb. 1922, *Smith 390* (**BK**); Phatthalung [Mueang, 20 Dec. 1979, *Shimizu et al.* 27759 (**BKF** 2 sheets, **L** 2 sheets); Khao Pu Khao Ya, 19 May 2011, *Choopan 2011-270* (**BKF**); Trang [Chong, 24 Jan. 1958, *Sørensen et al.* 566 (**BKF**, **C**, **E**); Khao Chong, 9 Oct. 1970, *Charoenphol et al.* 3513 (**AAU**, **L**); *ibid.*, 10 Oct. 1970, *Charoenphol et al.* 3588 (**AAU**, **BKF**, **K**, **L**); *ibid.*, 6 Feb. 1969, *Phusomsaeng & Pinnin 68* (**AAU**, **BKF**, **L**); *ibid.*, 9 Jan. 1968, *Sangkhachand 1505* (**BKF**, **C**, **E**, **L**); *ibid.*, 24 Feb. 1969, *Sangkhachand 1693* (**BK**); *ibid.*, 26 Nov. 1969, *Sangkhachand 2194* (**BK**); *ibid.*, 25 Jan. 1966, *Iwatsuki & Fukuoka 5499* (**BKF**, **L**); *ibid.*, 1 Feb. 1985, *Siriruga 948* (**C** 2 sheets, **L**); *ibid.*, 9 July 2000, *Middleton et al.* 366 (**BKF**); Khao Thong Lang, 19 Jan. 1966, *Hansen & Smitinand 12013* (**BKF**); *ibid.*, 20 Jan. 1966, *Hansen & Smitinand 12026* (**BKF**, **K**); Kradan Island, 11 Feb. 1966, *Hansen & Smitinand 12227* (**C**, **E**, **K**, **L**); Mueang, 17 Dec. 1979, *Shimizu et al.* 27489 (**BKF**); *ibid.*, 1 Feb. 1985, *Maxwell 85-136* (**BKF**); Satun [Padang Besar, 23 Dec. 1927, *Kerr 13563* (**BK**, **BM**, **K**); 10 Jan. 1928, *Kerr 13967* (**BK**, **BM**); Mueang, 18 Dec. 1979, *Shimizu et al.* 27581 (**BKF**); Khuan Kalong, 15 Oct. 1970, *Charoenphol et al.* 3848 (**AAU**, **BKF**, **L**); Thale Ban, 4 Nov. 1990, *Larsen et al.* 41099 (**AAU**); *ibid.*, 5 Nov. 1990, *Larsen et al.* 41134 (**AAU**); Ya Roei waterfall, 6 Nov. 1990, *Larsen et al.* 41175 (**AAU**, **C**); Songkhla [Ban Pin, 27 Mar. 1928, *Kerr 14840* (**BK**, **BM**); Boriphat waterfall, Rattaphum, 21 Dec. 1978, *Hamilton & Congdon 90* (**AAU**, **BKF**); *ibid.*, 18 Dec. 1979, *Shimizu et al.* 27592 (**BKF** 2 sheets, **C**, **L** 2 sheets); 21 Dec. 1965, *Umpai 269* (**BK**); Pattani [Bannang Sta, 25 July 1923, *Kerr s.n.* (**BM**); *ibid.*, 28 July 1923, *Kerr 7399* (**BK**, **BM**, **K**); Narathiwat [Bacho, 22

Dec. 1968, *anonymous* 32 (**BKF**); *ibid.*, 16 Dec. 1968, *Sangkachand* 1575 (**BK**); Hala Bala WS, 20 Feb. 2002, *Niyomdham & Puujaa* 6632 (**BKF**). Fig. 1C.

Distribution.— India, Myanmar, China, Laos, Vietnam, Malaysia, Indonesia (Java, Borneo).

Ecology.— In shaded moist evergreen forest, 80–350 m alt.

Phenology.— Flowering in December–April.

Vernacular.— Niao ma (เนี้ยวหมา), lai phueak (ไหลเผือก)(Peninsula).

Notes.— There was no type designation for *Eranthemum crenulatum*, a basionym of *Pseuderanthemum crenulatum*. However, it was illustrated in a figure published in the protologue, plate 879 in Botanical Register 11 (1825) and, therefore, is chosen as the lectotype here. Two varieties were previously recognized in Thailand: *P. crenulatum* var. *ecorticatum* and *P. crenulatum* var. *glabrum*. In this study, however, these have not been upheld as the characters are insufficiently consistent to allow recognition as varieties.

4. *Pseuderanthemum glomeratum* J.B.Imlay, Bull. Misc. Inform. Kew 1939(3): 133. 1939. Type: Thailand, Nan, Doi Wao, 23 Feb. 1912, *Kerr* 2438 (lectotype **ABD** [ABDUH:2/870!], designated by Imlay (1939); isolectotype **BM** [BM00950112!], **K** [K000885588!]).

Thailand.— NORTHERN: Nan [Doi Wao, 23 Feb. 1912, *Kerr* 2438 (**ABD**, **BM**, **K**)]. Fig. 1D.

Distribution.— Endemic.

Ecology.— In shaded hill evergreen forest, 700–1000 m alt.

Vernacular.— Khem doi wao (เข็มดอยวาว).

Notes.— This species is distinguished from *Pseuderanthemum parishii* by flowers always occurring in a cluster or whorl, longer peduncle, secondary veins 7–9 pairs which are purplish-red in colour, shorter corolla lobes, and staminodes 2–5 mm long.

5. *Pseuderanthemum graciliflorum* (Nees) Ridl., Fl. Malay Penin. 2: 591. 1923; Suvatti, Fl. Thailand 2: 1117. 1978; B.Hansen, Nordic J. Bot. 9(2): 213. 1989.— *Eranthemum graciliflorum* Nees in Wall., Pl. Asiat. Rar.3: 107. 1832. Type: Malaysia, Penang,

Porter ex Wallich 2427 (lectotype **K-W**!, designated by Hansen (1989); isolectotype **K** [K001115914!]).

— *Eranthemum acuminatissimum* Miq., Fl. Ind. Bat. 2: 835. 1856.— *Pseuderanthemum acuminatissimum* (Miq.) Radlk., Sitzungsber. Math.-Phys. Cl.Königl. Bayer. Akad. Wiss. München 13: 1883; Benoist, in Lecomte, Fl. Indo-Chine 4: 721. 1935. Type: Java, Jawa Tengah, Ungarang, Ungaram; *Junghuhn s.n.* (lectotype **K** [K000885582!], designated by Miquel (1856); isolectotype **U** [U00000085!]).

— *Eranthemum andersonii* Mast., Gard. Chron. 1869(6): 134. 1869; J.D.Hooker, Bot. Mag. 95: t.5771. 1869; C.B.Clarke in Hook.f., Fl. Brit. India 4: 499. 1885.— *Pseuderanthemum andersonii* (Mast.) Lindau in Engl. & Prantl, Nat. Pflanzenfam. 4: 330. 1895. Type: Figure in Bot. Mag. 95: t. 5771. 1869 (lectotype, selected here).

— *Eranthemum malaccense* C.B.Clarke in Hook.f., Fl. Brit. India 4: 498. 1885; in Rosenv., Bot. Tidsskr. 24: 349.1902 & J. Asiat. Soc. Bengal 74(3): 678. 1908; Ridl., J. Straits Branch Roy. Asiat. Soc. 59: 152. 1911 & Fl. Malay Penin. 2: 591. 1923.— *Pseuderanthemum malaccense* (C.B.Clarke) Lindau in Engl. & Prantl, Nat. Pflanzenfam. 4: 330.1895; Lindau, Frag. Fl. Philippinae: 40. 1904; J.D.Hooker, Bot. Mag. 137: t.8368. 1911. Type: *Cuming* 2389 (lectotype **K** [K000885603!], selected here).

Thailand.— NORTHERN: Chiang Mai [29 Jan. 1921, *Kerr* 4718 (**BK** 2 sheets, **K**); Wat Chiang Dao, 24 Sept. 1971, *Murata et al.* 14872 (**BKF**); Doi Chiang Dao, 31 Dec. 1955, *Suvarnakoses* 1055 (**BKF**, **K**); *ibid.*, 14 Dec. 1962, *Bunchuai* 38176 (**K**); *ibid.*, 6 Feb. 1983, *Koyama et al.* 33147 (**BKF**, **C**, **K**); *ibid.*, 17 Jan. 1973, *Sutheesorn* 2277 (**BKF**); *ibid.*, 18 Mar. 1950, *Garrett* 1285 (**K**, **L** 2 sheets); *ibid.*, 4 Dec. 1951, *Garrett* 1362 (**L** 2 sheets); *ibid.*, 14 Dec. 1962, *Bunchuai* 1252 (**BKF**, **L**); *ibid.*, 14 Dec. 1978, *Bjørnland & Schumacher* 481 (**BKF**, **C**); *ibid.*, 15 Jan. 1989, *Maxwell* 89-66 (**AAU**, **BKF**); *ibid.*, 5 Nov. 1989, *Maxwell* 89-1362 (**L**); *ibid.*, 5 June 1973, *Geesink et al.* 5714 (**L** 2 sheets); Doi Langka, 18 Nov. 1933, *Garrett* 832 (**BKF**, **C**, **K** 2 sheets, **L** 2 sheets); Fang, 4 Apr. 1921, *Kerr* 5223 (**BM**, **K**); *ibid.*, 27 Feb. 1958, *Sørensen et al.* 1720 (**C**, **E**); *ibid.*, 14 Jan. 1988, *Paisooksantivatana et al.* 2242-88 (**BK**); Khun Mae Tawn, 13 Sept. 1988, *Garrett* 1079 (**K**); Doi Suthep, 23 Mar. 1949, *Soradech* 424 (**BKF**); *ibid.*, 23 Mar. 1965, *Chernsirivathana & Hambanand* 363

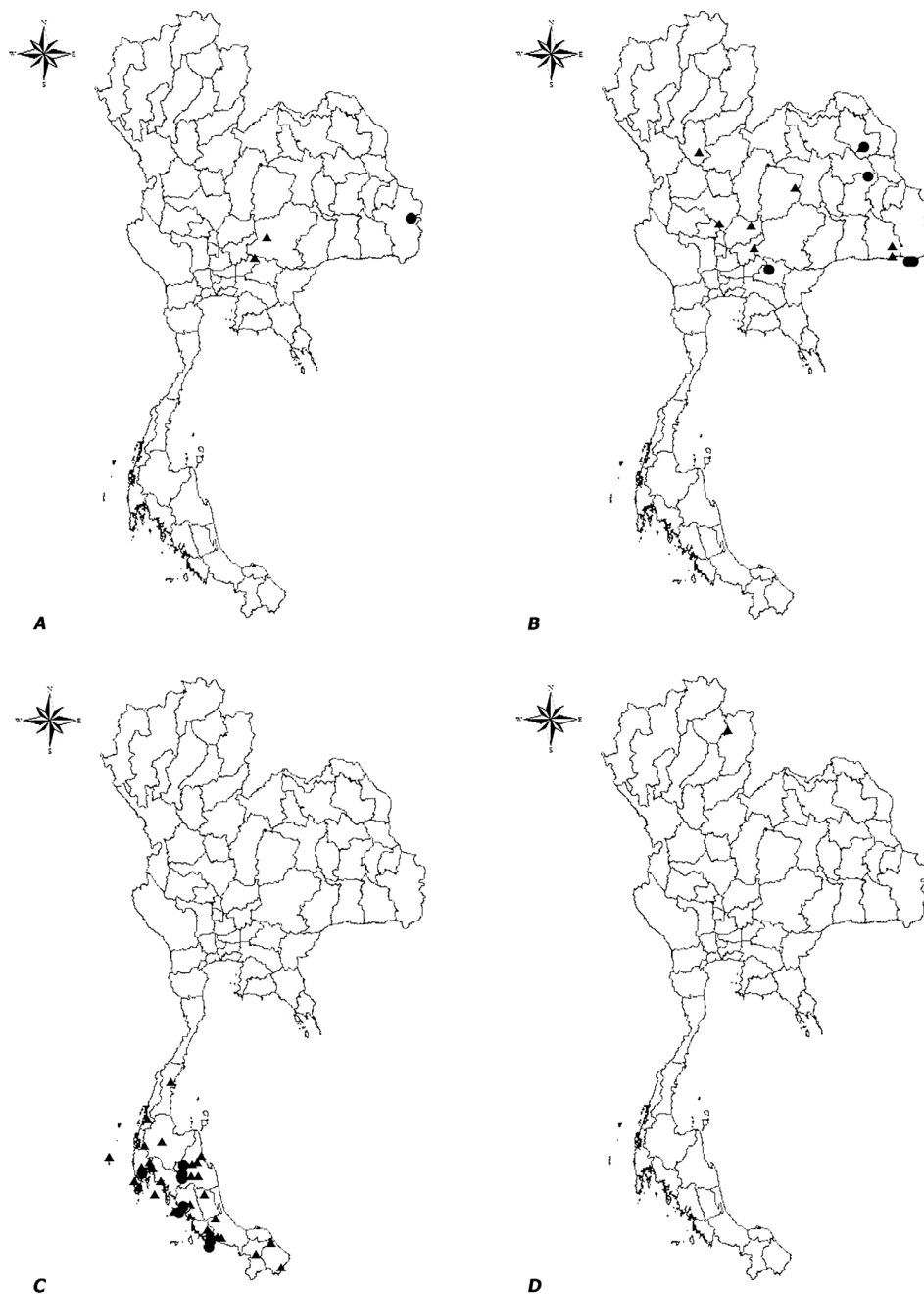


Figure 1. Distribution of *Pseuderanthemum* in Thailand: A. *P. axillare*; B. *P. bracteatum*; C. *P. crenulatum*; D. *P. glomeratum*. Circular symbols indicate field collection citation; triangular symbols indicate herbarium citation.

- (**BK, BKF**); Mae Rim, 22 Oct. 1993, *Nanakorn 048 (QBG)*; *ibid.*, 18 Nov. 1993, *Nanakorn 169 (QBG)*; *ibid.*, 18 Jan. 2006, *Singkaew s.n. (QBG no. 25542)*; *ibid.*, 27 Oct. 1989, *Maxwell 89-1303 (E, L)*; *ibid.*, 9 Jan. 1990, *Maxwell 90-44 (E, L)*; *ibid.*, 23 Mar. 2010, *Choopan 2010-012 (BKF)*; Doi Sa Ket, 26 Oct. 2007, *Pongamornkul 2144 (QBG)*; Wang Tao, 13 Feb. 1958, *Sørensen et al. 1065 (BKF, C)*; Maesa, 9 Nov. 1992, *Balik & Nanakorn 3428 (AAU)*; Mok Pha waterfall, 24 Nov. 1993, *Larsen et al. 44795 (AAU)*; Chiangmai University, 15 Apr. 1992, *Maxwell 92-151 (E)*; Sangamphaeng, 3 Dec. 1989, *Maxwell 89-1500 (E, L)*; *ibid.*, 19 Oct. 1995, *Palee 328 (BKF)*; Mae Cham, 16 July 1922, *Kerr s.n. (BM)*; Mae Taeng, 29 Oct. 2004, *Maxwell 04-646 (BKF)*; Doi Lon, 22 Nov. 2004, *Maxwell 04-719 (BKF)*; Chiang Rai [Maesai, 14 Feb. 1983, *Koyama et al. 33511 (C) & (BKF, L)*; *ibid.*, 15 Feb. 2005, *Maxwell 05-115 (BKF)*; *ibid.*, 28 Oct. 2005, *Maxwell 05-612 (BKF)*; *ibid.*, 21 Sept. 2010, *Bult 1070 (BKF)*; Doi Tam Tu Pu, 2 Nov. 1924, *Garrett 205 (BKF, BM, C, K, L)*; Mueang, 28 Nov. 1987, *Maxwell 87-1518 (BKF)*; Doi Tung, 24 Sept. 1967, *Iwatsuki et al. 10971 (BKF, C)*; Chiang Kham, 7 Jan. 1968, *Prayad 1183 (BK)*; Doi Luang, 25 Sept. 1997, *Petrmitr 126 (BKF, L)*; *ibid.*, 17 Feb. 1998, *Petrmitr 282 (BKF, L 2 sheets)*; *ibid.*, 29 Nov. 1991, *Maxwell 91-1073 (AAU, E, L)*; *ibid.*, 29 Oct. 1997, *Maxwell 97-1281 (BKF, L)*; Huai Pa Han, Khun Mae Taun, 13 Sept. 1938, *Garrett 1079 (L 2 sheets)*; Khun Chae NP, 4 Nov. 1997, *Maxwell 97-1462 (BKF, L)*; Doi Mae Salong, 7 Nov. 1993, *Maxwell 93-1365 (L)*; Huai Nam Rin village, 21 Dec. 1994, *Maxwell 94-1287 (BKF, L)*; Nan [Tad Man waterfall, Chiang Klang, 18 Nov. 1993, *Larsen et al. 44547 (AAU, K)*; Doi Phuka NP, 7 Oct. 1998, *Srisanga 281 (BKF, QBG)*; *ibid.*, 23 Sept. 2000, *Srisanga 1622 (BKF, QBG)*; Lampang [Mae Long, 19 Nov. 1924, *Winit 807 (BK, BKF)*; Lamping, Mae Saloi, 26 Oct. 1925, *Winit 1484 (BK, BKF)*; Chae Son NP., 20 Oct. 1995, *Maxwell 95-906 (BKF, L)*; *ibid.*, 8 Jan. 1996, *Maxwell 96-33 (L) & 96-35 (BKF)*; *ibid.*, 19 Feb. 1996, *Maxwell 96-283 (BKF, L)*; Doi Khun Tan NP, 3 Dec. 1994, *Maxwell 94-1258 (BKF, L)*; Phrae [11 Jan. 1972, *Beusekom et al. 4807 (BKF, L)*; Huai Rai, 16 Sept. 1982, *anonymous 404 (BKF)*]; Phitsanulok [Thung Salaeng Luang NP, 30 Sept. 1967, *Tagawa et al. 11246 (BKF 2 sheets, C, K)*; *ibid.*, 11 Dec. 1965, *Tagawa et al. 2046 (BKF 2 sheets, C, K)*; *ibid.*, 11 Oct. 1979, *Shimizu et al. 18380 (AAU, BKF 3 sheets, C, K)*; *ibid.*, 17 Sept. 1990, *Chantaranonthai et al. 90/302 (K)*; *ibid.*, 29 Dec. 1982, *Koyama et al. 31931 (BKF, C 2 sheets, K)*; *ibid.*, 21 Oct. 1984, *Murata et al. 38256 (BKF)*, *ibid.*, 22 Oct. 1984, *Murata et al. 38533 & 38471 (BKF)*; *ibid.*, 24 Nov. 1966, *Prayad 532 (BK)*; *ibid.*, no date, *Phusomsaeng 92 (BKF, L)*; NORTH-EASTERN: Phetchabun [18 Dec. 1906, *Hosseus 716 (BM, K)*; Wang Thong, 28 Dec. 1982, *Koyama et al. 31872 (BKF)*; Wang Chom Pu, 14 Jan. 1969, *Vacharapong 295 (BK)*]; Sakon Nakhon [Phu Phan, 10 Dec. 1980, *Umpai 632 (BK)*]; EASTERN: Nakhon Ratchasima [Khao Yai, 18 Nov. 1962, *Smitinand 7901 (BKF, L)*; *ibid.*, 31 Oct. 1970, *Charoenphol et al. 4346 (AAU)*; *ibid.*, 14 Mar. 1968, *Beusekom & Phengklai 31 (E)*; *ibid.*, 21 Nov. 1982, *Koyama et al. 30181 (BKF)*]; Buri Ram [17 Nov. 1976, *Phengklai et al. 3248 (BKF)*]; SOUTH-WESTERN: Kanchanaburi [Sai Yok, 11 Feb. 1959, *Sangkhachand 773 (BKF, K)*; Ban Tha Khanun, 11 Jan. 1985, *Koyama et al. 49006 (BKF, L)*; Klang Dong, Sisawat, 29 Jan. 1962, *Larsen 9365 (BKF, C, E)*; Wangka, 7 Feb. 1926, *Kerr 10455 (BK, BM)*; Ban Klang, 24 Jan. 1962, *Larsen 9236 (BKF, C, E)*; Thongphaphum, 21 Nov. 1997, *Chayamarit 996 (BKF 2 sheets)*; Sangkhlaburi, 3 Dec. 2005, *Pooma et al. 5841 (BKF, E)*; Thung Yai Naresuan WS, 18 Jan. 1994, *Maxwell 94-105 & 94-112 (BKF)*]; Phetchaburi [Kaeng Krachan NP, 23 Jan. 2005, *Williams et al. 1020 (BKF, E 2 sheets, K)*]; Prachuap Khiri Khan [Kui Buri, 22 Jan. 2004, *Middleton 2372 (BKF, K)*]; CENTRAL: Bangkok [1899, *Zimmermann s.n. (L) & 104 (BM)*; 4 Feb. 1983, *Terao 33145 (BKF)*; 6 Nov. 1930, *Lakshnakara 432 (BK)*; 7 Mar. 1958, *Sørensen et al. 1977 (C)*]; SOUTH-EASTERN: Prachin Buri [Khao Singto, 10 Nov. 1930, *Kerr 19834 (BK, BM, K)*; *ibid.*, 9 Nov. 1930, *Marcant 2564 (K)*; Khao Yai, 11 Jan. 1999, *Wongprasert et al. s.n. (BKF)*]; Rayong [Klaeng, 23 Nov. 1979, *Shimizu et al. 23408 (BKF 2 sheets) & 23434 (BKF 2 sheets)*; *ibid.*, 24 Nov. 1979, *Shimizu et al. 23550 (BKF 2 sheets)*]; Chanthaburi [11 Dec. 1935, *Vesterdal 474 (C)*; Khao Pra Bat, 23 Nov. 1930, *Lakshnakara 512 (BK, BM, C, K)*; Pong Namron, 27 Sept. 1958, *Sangkhachand 502 (BKF)*; 28 Nov. 1979, *Shimizu et al. 23881 (BKF 2 sheets)*, *23882 (BKF 2 sheets) & 23890 (BKF)*; Khao Sa Bap, 7 Nov. 1993, *Larsen et al. 44284 (AAU, BKF)*; *ibid.*, 5 Nov. 1954, *Sangkhachand 302 (BKF)*, Khao Soi Dao WS, 9 Nov. 1969, *Beusekom & Smitinand 2055 (AAU,*

- BKF, C, E, L**); *ibid.*, 18 Dec. 1974, *Geesink & Hiepko 7901 (BKF, L)*; *ibid.*, 15 Nov. 2010, *Choopan 2010-016 (BKF)*; Khao Chamao Khao Wong NP, 7 Nov. 1994, *Maxwell 94-1191 (BKF, L)*; *ibid.*, 5 Sept. 1972, *Larsen et al. 32441 (AAU, C, L)*; *ibid.*, 17 Nov. 2010, *Choopan 2010-037 (BKF)*; Phlio waterfall, 19 Jan. 1958, *Sørensen et al. 525 (C) & 526 (C 2 sheets)*; Trat (Krat) [Ban Rai, 29 Nov. 1924, *Kerr 9483 (BK, BM, K)*; Khao Kuap, 27 Dec. 1929, *Kerr 17836 (BK, BM)*]; PENINSULAR: Chumphon [Mueang, 26 Feb. 1983, *Koyama et al. 33722 & 33731 (BKF)*; Pha To, 2 May 1974, *Tyapan 201 (BK)*; Langsuan, 9 Feb. 1927, *Kerr 11907 (BK, BM)*; *ibid.*, 26 Feb. 1927, *anonymous 12117 (BK, BM, C, K, L)*; Ranong [La Un, 2 Jan. 1929, *Kerr 16495 (BK, BM, K)*; Klong Kam Puang, 26 Apr. 1973, *Geesink & Santisuk 4945 (AAU, BKF, C, E, K, L 2 sheets)*; Khao Phota Luangkaeo, Kaper, 27 Feb. 1983, *Koyama et al. 33807 (BKF, C, K)*; *ibid.*, 9 Dec. 1979, *Shimizu et al. 26634 (BKF 2 sheets)*; Klong Naka WS, 3 Feb. 1979, *Koyama et al. 15208 (AAU, BKF 3 sheets)*; *ibid.*, 25 Apr. 1973, *Geesink & Santisuk 4874 (L), 4920 (L)*; Kra Buri, 28 Feb. 1968, *Vacharapong 166 (BK)*; Surat Thani [Ban Krut, 20 Feb. 1930, *Kerr 18159 (BM)*; Tao Island, 27 Dec. 1926, *Kerr 11106 (BK, BM, K)*; *ibid.*, 20 Feb. 1930, *Kerr 12159 (BK, K)*; *ibid.*, 12 Apr. 1927, *Kerr 12659 (BK, BM, K)*; Samui Island, 10 Apr. 1927, *Kerr 12618 (BK, BM, K)*; *ibid.*, 4 Feb. 1987, *Maxwell 87-144 (AAU, BKF)*; *ibid.*, 15 Feb. 2005, *Chayamarit et al. 58 (BKF 2 sheets)*; Pha Ngan Island, 4 Dec. 1974, *Geesink et al. 7754 (BKF, C, K, L)*; Pha Luei Island, 1 June 1960, *Chirayupin 145 (BK)*; Khao Sok NP, 2 Mar. 1983, *Koyama et al. 33947 (BKF, C)*; Pet Island, 28 Jan. 1935, *Seidenfaden 2460 (C)*; Bang Bao, 6 Feb. 1935, *Seidenfaden 2531 (C)*; *ibid.*, 9 Mar. 1957, *Gram & Larsen 143 (C)*; Khlong Saeng WS, 15 Feb. 1994, *Maxwell 94-204 (BKF)*; Phangnga [Thapput, 24 Feb. 1971, *Sadakorn 221 (BK 2 sheets)*; *ibid.*, 5 Mar. 1972, *Sadakorn 672 (BK 2 sheets)*]; Krabi [9 Nov. 1930, *Marcant 2564 (C)*; Khao Pra Bangkram, 14 Feb. 1991, *Niyomdham et al. 2086 (BKF)*; Nai Chong, 19 Jan. 1966, *Hansen & Smitinand 12004 (BKF, C, K)*; *ibid.*, 23 Feb. 1982, *Sutheesorn 5232 (BK)*; *ibid.*, Apr. 1915, *Vanpruk 740 (K)*; *ibid.*, 24 Feb. 1959, *Umpai s.n. (BK)*; Nakhon Si Thammarat [27 Nov. 1951, *Suvarnakoses 183 (BKF)*; Khao Luang, 3 Feb. 1966, *Hennipman 3822 (L)*; *ibid.*, 7 Feb. 1966, *Hennipman 3921 (BKF, C, K, L)*; *ibid.*, Apr. 1922, *Smith 716 (BK, BM, K)*; *ibid.*, 2 May 1928, *Kerr 15574 (BK, BM, K)*; *ibid.*, 20 Feb. 1991, *Niyomdham et al. 2199 (BKF)*; *ibid.*, 20 Jan. 1966, *Tagawa et al. 4716 (BKF)*; *ibid.*, 5 Mar. 1983, *Koyama et al. 34051 (BKF)*; *ibid.*, 25 Aug. 1967, *Iwatsuki et al. 8545 (BKF)*; *ibid.*, 23 May 2011, *Choopan 2011-295 (BKF)*; Khiriwong, 18 May 1924; *ibid.*, 18 May 1954, *Suvarnakoses 823 (BKF, K)*; *ibid.*, 9 Oct. 1957, *Sangkachand 719 (BKF)*; *ibid.*, 22 July 1951, *T.S. 681 (BKF)*; *ibid.*, 23 Feb. 1962, *Ploenchit 1810 (BKF)*; Thung Song, 18 Feb. 1929, *Put 2367 (BK, BM, K)*; Ronphibun, Feb. 1922, *Smith 383 (BK, BM)*; Yong waterfall NP, 4 Mar. 1983, *Koyama et al. 33993 (BKF)*; Walailak University, 31 May 1995, *Nanakorn 3573 (QBG)*; Lansaka, 17 Mar. 1985, *Ramsri 2 (BKF)*; *ibid.*, no date, *Suvarnakoses 542 (BKF)*; Kungching waterfall, 2 Mar. 1986, *Maxwell 86-124 (BKF)*; Phatthalung [Phatthalung WRS, 22 Feb. 2002, *Puudjaa 1031 (BKF)*]; Trang [no date, *Vanpruk 740 (E)*; Khao Soi Dao, 27 Apr. 1930, *Kerr 19143 (BK, BM, K)*; Khao Chong, 7 Feb. 1966, *Boonnab 324 (BKF)*; *ibid.*, 5 Jan. 1979, *Hamilton & Congdon 194 (AAU, BKF)*; *ibid.*, 6 Mar. 1976, *Chermsirivathana 2170 (BK)*; *ibid.*, 2 Mar. 1969, *Sangkachand 1731 (BK)*; *ibid.*, 1 Feb. 1985, *Sirirugsa 958 (C)*; Yan Ta Khao, 22 Mar. 1998, *Chamchumroon s.n. (BKF)*; *ibid.*, 20 May 2011, *Choopan 2011-279 (BKF)*; Khao Phap Pha, 11 Mar. 1974, *Larsen & Larsen 33133 (AAU, BKF, L)*; Satun [10 Mar. 1928, *Lakshnakara 327 (BK, K)*; Tarutao Island, 27 Feb. 1966, *Burkill 3974 (BKF, C, L)*; *ibid.*, 3 Mar. 1970, *Chermsirivathana 1613 (BK) & 1614 (BK)*; *ibid.*, 13 Dec. 1979, *Congdon 249 (AAU)*; Kuan Kalong, 15 July 1966, *Phengklai 1298 (BKF, L)*; Padang Besar, 23 Dec. 1927, *Kerr 13572 (BK, BM)*; Songkhla [Kho Hong Hill, 20 Mar. 1993, *Chantaranonthai et al. 1250 (K)*; Hat Yai, 27 Oct. 1993, *Larsen et al. 44080 (AAU, BKF)*; *ibid.*, 19 Dec. 1979, *Shimizu et al. 27717 (BKF)*; *ibid.*, 15 Sept. 1984, *Maxwell 84-214 (BKF)*; *ibid.*, 20 Mar. 1986, *Maxwell 86-182 (AAU, BKF, E)*; *ibid.*, 4 June 1992, *Larsen et al. 42604 (AAU)*; *ibid.*, 11 June 1992, *Larsen et al. 42808 (AAU)*; Ton Nga Chang WS, 19 Dec. 1979, *Shimizu et al. 27707 (BKF)*; *ibid.*, 17 Dec. 1984, *Maxwell 84-532 (BKF)*; Suan Tun waterfall, 12 Feb. 1985, *Maxwell 85-176 (BKF, C)*; Boriphat waterfall, 1990, *Larsen et al. 41228 (AAU)*; Khao Choosak, 27 Jan. 1979, *Congdon 230 (AAU)*; Khao Tang Kuan, 24 Feb. 1941, *Premrasami s.n.*

(**BKF** 2 sheets)]; *Pattani* [Banang Sta, 27 July 1923, *Kerr* 7374 (**BK, BM, K**); *ibid.*, 28 July 1923, *anonymous* 7395 (**BK, BM, K**)]; Yala [Betong, 2 Aug. 1923, *Kerr* 7476 (**BK, BM, K**); *ibid.*, 24 Aug. 1923, *Kerr s.n.* (**BM**); *ibid.* 26 Aug. 1923, *Kerr* 7662 (**BK, BM**) & 7919 (**BK, K**)]; Narathiwat [Ban Wo, Toh Moh, 18 Apr. 1931, *Lakshnakara* 698 (**BK, BM, K**); Nikomwaeng, 19 Mar. 1968, *Prayad* 1235 (**BK**); *ibid.*, Mar. 1968, *Phusomsaeng* 435 (**BKF**); *ibid.*, 27 Feb. 1974, *Larsen & Larsen* 32686 (**AAU**); Sukhirin, 16 Feb. 1997, *Puujaa* 382 (**BKF**)]. Fig. 2A.

Distribution.— Myanmar, China, Laos, Vietnam, Malaysia, Indonesia, Philippines.

Ecology.— In shaded hill and moist evergreen forest, also cultivated as ornamental plants throughout the country, 30–900 m alt.

Phenology.— Flowering in September–March.

Uses.— Cultivated as ornamentals. The roots are used to treat fever.

Vernacular.— Thao lang lai (เผ่าหลังลาย), chiang phra pa (เลี้ยงพราป่า), yai plang (ยายปลั่ง), yai klang (ยายกลั่ง) (Surat Thani), rong mai (รองไม้, รงไม้), khem maung (เข็มม่วง) (General).

Notes.— This species is distinguished from other taxa within the genus by the dense inflorescence, with three, or usually more, flowers to each bract, the corolla tube being profusely glandular pubescent (and usually without any other kind of pubescence), and the middle abaxial lobe with a swollen tongue-like patch.

6. *Pseuderanthemum latifolium* (Vahl) B.Hansen, *Nordic J. Bot.* 9(2): 213. 1989; C.C.Hu *et al.* in C.Y.Wu *et al.*, *Fl. China* 19: 440. 2011.— *Justicia latifolia* Vahl, *Symb. Bot.* 2: 4. 1791. Type: unknown origin, *Koenig s.n.* (holotype **C** [C10005094!], designated by Hansen (1989).

— *Antheliacanthus micranthus* Ridl., *J. Fed. Malay States Mus.* 10: 109. 1920. Type: Thailand, Koh Ra, 5 Nov. 1919, *Kloss* 6594 (holotype **K** [K000885587!], designated by Ridley (1920).

— *Justicia palatifer* Wall., *Pl. Asiat. Rar.* 1: 80. 1830.— *Eranthemum palatiferum* (Wall.) Nees in Wall., *Pl. Asiat. Rar.* 3: 108. 1832 & in A.DC., *Prodr.* 11: 457. 1847; J.D.Hooker, *Bot. Mag.* 98: t. 5957. 1872; C.B.Clarke in Hook.f., *Fl. Brit. India* 4: 498. 1885; T.Anderson, *J. Linn. Soc. Bot.* 9: 524. 1867.

— *Pseuderanthemum palatiferum* (Wall.) Radlk., *Sitzungsber. Math.-Phys. Cl.Königl. Bayer. Akad. Wiss. München* 13: 286. 1883. Type: Figure in *Pl. Asiat. Rar.* 1: t. 92. 1830 (lectotype, selected here).

— *Eranthemum malabaricum* C.B.Clarke in Hook.f., *Fl. Brit. India* 4: 497. 1885; Trimen, *Handb. Fl. Ceylon* 3: 325. 1895.— *Pseuderanthemum malabaricum* (C.B.Clarke) Gamble, *Fl. Madras* 2(6): 1064. 1924. Type: India, *Wight s.n.* (not located, likely to be Malabar).

— *Eranthemum pumilio* C.B.Clarke in Rosenv., *Bot. Tidsskr.* 24: 350. 1902. Type: Thailand, Trat, Koh Chang, 5 Jan. 1900, *Schmidt* 59 (holotype **C** [C10005093!]).

Thailand.— NORTHERN: Mae Hong Son [Khun Yuam, 13 Jan. 1983, *Koyama et al.* 32437 (**BKF**)]; Chiang Mai [Doi Phahompok NP, 22 Mar. 2011, *Choopan* 2011-187 (**BKF**); Doi Chiang Dao WS, 15 Jan. 1989, *Maxwell* 89-52 (**BKF**); *ibid.*, 11 Mar. 1989, *Maxwell* 89-328 (**AAU, BKF**); *ibid.*, 21 Mar. 1989, *Maxwell* 89-368 (**BKF, L**); *ibid.*, 21 Mar. 1950, *Garrett* 1289 (**L**); *ibid.*, 25 Mar. 1950, *Garrett* 1295 (**K** 2 sheets, **L**); *ibid.*, 25 Mar. 1955, *Garrett* 1442 (**L**); *ibid.*, 28 Mar. 1955, *Garett* 1443 (**K, L**); *ibid.*, 14 Mar. 1956, *Suvarnakoses* 1109 (**BKF**); *ibid.*, 20 Feb. 1958, *Bunchuai* 734 (**BKF**); *ibid.*, 5 July 1959, *Bunchuai* 904 (**BKF**); *ibid.*, 10 Apr. 1996, *Gardner* 920 (**L**); *ibid.*, 6 Feb. 1983, *Koyama et al.* 33150 (**BKF**); Doi Suthep-Pui NP, 9 May 1989, *Maxwell* 89-581 (**BKF**); Wang Tao, 22 Apr. 1958, *Sørensen et al.* 2954 (**C**); Chiang Rai [Mae Sai, 14 Feb. 1983, *Koyama et al.* 33511 (**BKF, L**)]; Lampang [Doi Khun Tan NP, 15 Feb. 1995, *Maxwell* 95-97 (**L**)]; Phrae [Huai Rai, no date, *anonymous* 17124 (**BKF**); Huai Hom Noi, 17 Mar. 1951, *Phengklai* 35 (**BKF, K**)]; Tak [Khun Pha Wo NP, 21 Jan. 1983, *Koyama et al.* 32826 (**BKF**); *ibid.*, 26 Mar. 2011, *Choopan* 2011-205 (**BKF**); Umphang WS, 27 Mar. 2011, *Choopan* 2011-210 (**BKF**)]; Sukhothai [Mueang Kao, 8 Mar. 1972, *Maxwell* 72-69 (**BK**); Ramkamhaeng NP, 27 Jan. 1995, *Maxwell* 95-13 (**BKF, L** 2 sheets)]; NORTH-EASTERN: Phetchabun [Tha Duang, 4 Mar. 1931, *Kerr* 20359 (**BK, BM**)]; SOUTH-WESTERN: Kanchanaburi [Bam Pompi, Sangkhlaburi, 24 Mar. 1967, *Prayad* 711 (**BK**); *ibid.*, 25 Mar. 1968, *Beusekom & Phengklai* 104 (**BKF, C, E, K, L**); between Khao Yai and Khao Ngai Yai, 8 Apr. 1968, *Beusekom & Phengklai* 404 (**BKF** 2 sheets, **E, K, L**); Wangka, 6 Feb. 1926, *Kerr* 10658 (**K**); Tha Khanun,

23 Jan. 1926, *Kerr* 10292 (**BK, BM, C, K**); Thung Yai Naresuan WS, 20 Mar. 1993, *Maxwell* 93-298 (**BKF** 2 sheets, **L**); *ibid.*, 19 Jan. 1994, *Maxwell* 94-112 (**L**); Sangkhlaburi, 19 Feb. 1950, *Prayoon* 49 (**BKF**); *ibid.*, 25 Feb. 2005, *Bult* 832 (**BKF**); Keoeng Krawia, 3 Feb. 1962, *Larsen* 9526 (**C**); Tham Pra, 23 Dec. 1961, *Phengklai* 309 (**BKF**); SOUTH-EASTERN: Chon Buri [Ra Island, 5 Nov. 1919, *Kloss* 6594 (**K**)]; Trat [Chang Island, 5 Jan. 1900, *Schmidt* 59 (**C**); *ibid.*, 6 Jan. 1900, *Schmidt* 83 (**C**); *ibid.*, 7 Jan. 1900, *Schmidt* 98 (**C**); *ibid.*, 9 Jan. 1900, *Schmidt* 121 (**C**); *ibid.*, 15 Jan. 1900, *Schmidt* s.n. (**C**); *ibid.*, 4 Feb. 1900, *Schmidt* 392 (**C**); *ibid.*, Jan. 1900, *Schmidt* 791 (**C**)]. Fig. 2B.

Distribution.—India, Nepal, Bhutan, Myanmar, China, Laos, Cambodia, Vietnam, Malaysia.

Ecology.—In shaded evergreen forest, 300–500 m alt.

Phenology.—Flowering in September–March.

Vernacular.—Khem thi lo su (เข็มที่ลอสู).

Notes.—This species is distinguished from other taxa within the genus by the middle abaxial lobe having dark purple dots aligned in a V-shape. The leaves are larger than in other species and have distinct paler green or yellowish-green bands along the veins. As there was no designation of the type for *Justicia palatiferum*, a figure from the protologue in *Plantae Asiaticae Rariores* (Wallich, 1830: 92) is chosen here as the lectotype.

7. *Pseuderanthemum longistylum* J.B. Imlay, Bull. Misc. Inform. Kew 1939: 134. 1939. Type: Thailand, Bangkok, 20 Nov. 1930; *Kerr* 19866 (lectotype **BK** [SN257629!], designated by Imlay (1939); isolectotypes **ABD** [ABDUH:2/871!], **BM** [BM000950111!], **K** [K000885586!]).

Thailand.—NORTHERN: Lamphun [Doi Khun Tan NP, 15 Feb. 1995, *Maxwell* 95-97 (**BKF**)]; Phrae [17 Mar. 1961, *Phengklai* 26196 (**K**)]; NORTH-EASTERN: Loei [Wang Saphung, 9 Mar. 1924, *Kerr* s.n. (**BK, BM**)]; EASTERN: Chaiyaphum [Phu Khieo, 24 Feb. 1931, *Kerr* 20247 (**BK, BM, K**); Nong Bua Daeng, 3 Mar. 1931, *Kerr* 20311 (**BM**); Tatton NP, 23 Nov. 2010, *Choopan* 2010-048 (**BKF**); Nakhon Ratchasima [Lam Phraphloeng Dam, 29 Jan. 1983, *Koyama et al.* 33106 (**BKF, L**)]; SOUTH-WESTERN: Uthai Thani [Huai Kha Khaeng WS, 12 Nov. 1979,

Shimizu et al. 22267 (**BKF** 2 sheets, **L**) & 22284 (**BKF** 2 sheets, **L**); Kanchanaburi [Tha Khanun, 23 Jan. 1926, *Kerr* 10292 (**C**); *ibid.*, 20 Feb. 1926, *Kerr* 10533 (**BK, BM, K**); Sisawat, 13 Jan. 1926, *Kerr* 10202 (**BK, BM, K**); Sai Yok, 25 Jan. 1983, *Koyama et al.* 32876 (**BKF**); *ibid.*, 26 Jan. 1983, *Koyama et al.* 32971 (**BKF**) & 32976 (**BKF**); *ibid.*, 10 Dec. 1961, *Larsen* 8651 (**C**); *ibid.*, 28 Dec. 1961, *Larsen* 9011 (**C**); *ibid.*, 2 Jan. 1962, *Larsen* 9105 (**C**); Erawan NP, 25 Jan. 1962, *Larsen* 9260 (**BKF, C**); *ibid.*, 18 Nov. 1971, *Beusekom et al.* 3828 (**BKF, L**); Tham Than Lot NP, 7 Nov. 1979, *Shimizu et al.* 22007 (**BKF**); Hat Phalom, 20 Dec. 1961, *Larsen* 8834 (**C**); Ratchaburi [Suan Pheung, 27 Jan. 2001, *Niyomdham* 6403 (**BKF**); Khao Nam Tok, 10 Sept. 1966, *Larsen et al.* 1359 (**AAU**)]; Phetchaburi [Kaeng Krachan NP, 4 Dec. 1993, *Larsen et al.* 45042 (**AAU**); *ibid.*, 25 Dec. 2007, *Phonsena et al.* 5754 (**BKF**); Tha Yang, 6 Feb. 2008, *Maxwell* 08-29 (**QBG**)]; Prachuap Khiri Khan [Bangsaphan, 28 Dec. 1927, *Put* 1416 (**BK, BM, K**); *ibid.*, 27 Dec. 1927, *Put* 1400 (**BM**); *ibid.*, 5 Sept. 2008, *Middleton et al.* 4285 (**AAU, BKF, E**); *ibid.*, 12 Feb. 1970, *Beusekom & Santisuk* 2813 (**L**); *ibid.*, 13 Nov. 1944, *Thaao* 124 (**BKF**); Pran Buri, 26 Nov. 1929, *Put* 2455 (**BK, BM, K**); *ibid.*, 8 Feb. 1964, *Phengnaren* 161 (**BKF**); *ibid.*, 4 Feb. 1964, *Smitinand* 8509 (**BKF**); Khao Chrongwan, 18 Aug. 1967, *Shimizu et al.* 7684 (**BKF**); Huai Yang waterfall, 24 Oct. 1964, *Chermsirivathana* 176 (**BK**); *ibid.*, 4 Oct. 1930, *Put* 3192 (**BK, BM**); *ibid.*, 6 Mar. 1983, *Koyama et al.* 34095 (**BKF**)]; CENTRAL: Lop Buri [20 Oct. 1984, *Mitsuta et al.* 38205 (**BKF**); Sap Champa, 4 Dec. 1982, *Koyama & Terao* 30589 (**BKF**); *ibid.*, 19 Nov. 1984, *Murata et al.* 50953 & 68110 (**BKF**); Saraburi [Phukhae BG, 3 Dec. 1982, *Koyama & Terao* 30541 (**BKF**); *ibid.*, 4 Dec. 1982, *Koyama & Terao* 30556 (**BKF, C**); *ibid.*, 6 Oct. 1979, *Shimizu et al.* 17876 (**BKF**); Tham Phra Phothisat, 7 Oct. 1979, *Shimizu et al.* 19401 (**BKF** 2 sheets, **C, L** 2 sheets); Namtok Sam Lan, 26 Jan. 1975, *Geesink & Maxwell* 8370 (**BKF, L**); *ibid.*, 9 Dec. 1973, *Maxwell* 73-725 (**BK**) & 73-729 (**AAU**); *ibid.*, 6 Mar. 2004, *Maxwell* 04-126 (**BKF**); Phra Bat Temple, 7 Feb. 1971, *Maxwell* 71-56 (**AAU, BK**); Muak Lek waterfall, 19 Feb. 1962, *Larsen* 9687 (**C** 2 sheets); Nakhon Nayok [Nang Rong waterfall, 22 Nov. 1982, *Koyama et al.* 30229 (**BKF**); Salika waterfall, 4 Apr. 1972, *Maxwell* 72-182 (**AAU, BK**)]; Bangkok [no date, *Kerr* 494 (**BM**);

6 Feb. 1920, *Kerr* 3995 (**BM**, **K** 2 sheets); 8 Aug. 1920, *Kerr s.n.* (**BM**); 4 Feb. 1923, *Kerr s.n.* (**BK**); 18 Feb. 1923, *Kerr* 6752 (**BK**, **BM**, **K**); 20 Nov. 1930, *Kerr* 19866 (**ABD**, **BK**, **BM**, **K**); 15 Feb. 1932, *Put s.n.* (**BK**); 22 Feb. 1970, *Maxwell* 70-30 (**AAU**); 15 Feb. 1932, *Put s.n.* (**BM**); Samut Prakan [Phrapadaeng, 22 Feb. 1970, *Maxwell* 70-30 (**BK**)]; SOUTH-EASTERN: Prachin Buri [Chakan Arboretum, 30 Jan. 1983, *Koyama et al.* 33113 (**BKF**)]; Chon Buri [Khao Khieo, 11 Jan. 1975, *Maxwell* 75-7 (**BK**, **L**); Khao Sa Bap, Phlio waterfall, 7 Nov. 1993, *Larsen et al.* 44294 righthand specimen (**AAU**); Sattahip, 2 Jan. 1972, *Maxwell* 72-14 (**AAU**, **BK**); Sichang Island, 7 Nov. 1969, *Beusekom & Smitinand* 2043 (**AAU**, **C**, **L** 2 sheets); Rayong [Samet Island, 12 Jan. 1985, *Ryding* 913 (**AAU**)]; Chanthaburi [11 Dec. 1935, *Vesterdal* 441 (**C**); 1936?, *Vesterdal* 5 (**C**); Khao Chamao Khao Wong NP, 23 Nov. 1979, *Shimizu et al.* 23560 (**BKF**); *ibid.*, 17 Nov. 2010, *Choopan* 2010-035 (**BKF**); Khao Soi Dao, 11 Nov. 1969, *Beusekom & Smitinand* 2117 (**AAU**, **BKF**, **C**, **E**, **K**, **L**); *ibid.*, 15 Jan. 1958, *Sørensen et al.* 352 (**C**); *ibid.*, 14 Nov. 2010, *Choopan* 2010-015 (**BKF**); Khao Khitchakut NP, 29 Nov. 1979, *Shimizu et al.* 26041 (**BKF** 2 sheets, **L** 2 sheets); Krathing waterfall, 21 Oct. 1972, *Maxwell* 72-448 (**AAU**, **BK**); Khao Sabap, 6 June 1948, *Chit* 348 (**BKF**); Trat [Bo Rai, Krut, 28 Nov. 1924, *Kerr* 9460 (**BK**, **BM**, **K**); Dan Chumphon-Krut, 20 Dec. 1929, *Kerr* 17644 (**BK**, **BM**); Khao Kuap-Krat, 24 Dec. 1929, *Kerr* 17732 (**BM**); Ban Krut, 20 Feb. 1930, *Kerr* 18163 (**BK**, **BM**, **K** 2 sheets); Ban Kadan, 21 Nov. 1971, *Vidal* 5797 (**AAU**); Namtok Phlio NP, 2 Dec. 1964, *Sakol* 293 (**BK**); *ibid.*, 16 Nov. 2010, *Choopan* 2010-025 (**BKF**); Chang Island, Jan. 1922, *Smith* 281 (**BK**); PENINSULAR: Chumphon [Thasae, 16 Jan. 1987, *Maxwell* 87-69 (**BKF**, **L**); Hot spring forest park, 26 Feb. 1983, *Koyama et al.* 33724 (**BKF**) & 33736 (**BKF**); Matra Island, 10 June 1969, *Jaray* 166 (**BK**)]; Ranong [Lam Liang, 28 Dec. 1928, *Kerr* 16418 (**BK**, **BM**, **K**); Chang Island, 11 Jan. 1929, *Kerr* 16609 (**BK**, **BM**, **K**); Klong Kampaum, 29 Jan. 1929, *Kerr* 16879 (**BK**, **BM**); Klong Naka WS, 20 Feb. 2002, *Chamchumroon et al.* 1276 (**BKF**)]; Surat Thani [Tao Island, 29 Dec. 1924, *Kerr* 11149 (**BK**, **BM**, **K**); *ibid.*, 13 Apr. 1927, *Kerr* 12708 (**BK**, **BM**, **K**); *ibid.*, 10 July 1927, *Kerr s.n.* (**BK**, **BM**); *ibid.*, 20 Sept. 1928, *Kerr s.n.* (**BM**)]. Fig. 2C.

Distribution.— Endemic.

Ecology.— In shaded mixed deciduous forest with bamboo and evergreen forest on sandstone, sandy soil, 100–500 m alt.

Phenology.— Flowering in October–December.

Uses.— All parts of plant used for bath and cure wounds.

Vernacular.— Miat nok (เหมี้ยदनก), ya khamoi (ยาขโมย), phaya chon (พญาโจน).

Notes.— This species is distinguished by having 1–5 long branches at the base of the inflorescences, each branch a lax thyrse. The corolla lobes are purple with reddish purple dots on the middle lobe or on all three lobes of the abaxial lip.

8. *Pseuderanthemum parishii* (T. Anderson) Lindau in Engl. & Prantl, Nat. Pflanzenfam. 4(3b): 330. 1895; Benoist in Lecomte, Fl. Indo-Chine 4: 719. 1935.— *Asystasia parishii* T. Anderson, J. Linn. Soc. Bot. 9: 526. 1867.— *Eranthemum parishii* (T. Anderson) C. B. Clarke in Hook. f., Fl. Brit. India 4: 499. 1885. Type: Myanmar, Tenasserim; *Parish* 409 (holotype **K** [K000885488!]).

— *Eranthemum crenulatum* Nees var. *grandiflorum* Hook., Bot. Mag. 90: t. 5440. 1864, excl. syn. Type: Figure of in Bot. Mag. 90: t. 5440. 1864 (lectotype, selected here)

Thailand.— NORTHERN: Chiang Mai [Doi Suthep, 14 Jan. 1910, *Kerr* 938 (**K**, **L**); *ibid.*, 29 Dec. 1904, *Hosseus* 267 (**BM**, **E**, **K**, **L**); *ibid.*, 30 Jan. 1988, *Maxwell* 88-115 (**BKF** 2 sheets, **L**); *ibid.*, 25 Dec. 1988, *Maxwell* 88-1399 (**L**); *ibid.*, 23 Jan. 1990, *Maxwell* 90-110 (**L**); *ibid.*, 7 Jan. 1993, *Maxwell* 93-16 (**BKF**, **L**); *ibid.*, 2 Feb. 1959, *Sørensen et al.* 6836 (**BKF**, **C**); *ibid.*, 5 Feb. 1977, *Anderson* 4230 (**C**); Fang, 27 Jan. 1969, *Nooteboom et al.* 859 (**BKF**, **C**, **K**); Mae Sa, 15 Feb. 1983, *Koyama et al.* 33576 (**BKF**); Bo Luang, 2 Feb. 1964, *Hansen et al.* 11030 (**BK**, **BKF**, **C**, **E**, **K**, **L**); Chiang Rai [Doi Luang NP, 21 Dec. 1997, *Petrmitr* 180 (**BKF**, **L**); *ibid.*, 17 Feb. 1998, *Petrmitr* 281 (**BKF**, **L**); Doi Hang, 29 Dec. 1924, *Garrett* 208 (**BKF**); Chiang Kham, 7 Dec. 1967, *Prayad* 1104 (**BK**)]; Nan [Doi Phu Kha NP, 17 Jan. 2002, *Srisanga* 2393 (**BKF**, **QBG**); Sila Peth waterfall, 14 Dec. 1990, *Larsen et al.* 41960 (**AAU**, **BKF**, **C**)]; Lampang [Chae Son NP, 7 Jan. 1992, *Maxwell* 92-15 (**E**, **L**); *ibid.*, 28 Jan. 1997, *Panatkool* 140 (**L**); *ibid.*, 15 Jan. 2011, *Choopan* 2011-162

(**BKF**); Doi Khun Tan NP, 29 Dec. 1994, *Maxwell 94-1327* (**BKF, L**); Phrae [Mae Yom NP, 8 Dec. 1993, *Maxwell 93-1448* (**L**); *ibid.*, 12 Jan. 2011, *Choopan 2011-128* (**BKF**)]; Phitsanulok [Thung Salaeng Luang NP, 9 Feb. 1964, *Hansen et al. 11087* (**BKF, C, K, L**); Nakhon Thai, 20 Dec. 1905, *Hosseus 722a* (**BM, E** 2 sheets, **K**); Chattakan, 24 Nov. 2006, *Wattthana & Kurzweil 2172* (**QBG**)]; NORTH-EASTERN: Loei [Phu Luang, 24 Nov. 1957, *Bunpheng 964* (**BKF, K**); *ibid.*, 7 Dec. 1965, *Tagawa et al. 1913* (**BKF, L**); *ibid.*, 20 Nov. 1968, *Chermsirivathana 1182* (**BK**); *ibid.*, 19 Feb. 1983, *Koyama et al. 33678* (**BKF, L**); Phu Kradueng NP, 17 Nov. 1979, *Shimizu et al. 22707* (**BKF**); *ibid.*, 17 Dec. 1982, *Koyama et al. 31202* (**BKF, C, L**); *ibid.*, 10 Dec. 2001, *Chaikong 60/44* (**KKU**); *ibid.*, 25 Dec. 2010, *Choopan 2010-111* (**BKF**)]; Udon Thani [Ban Na Luang, 6 Jan. 1966, *Hennipman 3519* (**BKF, C, L**); Sakon Nakhon [9 Dec. 1962, *Adisai 213* (**BK**); Phu Phan, 14 Dec. 1962, *Suvarnakoses 2005* (**BKF, L** 2 sheets)]; Khon Kaen [Pha Nok Khao, 17 Nov. 1979, *Shimizu et al. 23240* (**BKF** 2 sheets, **C, L** 2 sheets); *ibid.*, 21 Dec. 1982, *Koyama et al. 31480* (**C, L**); *ibid.*, 16 Dec. 1963, *Umpai 151* (**BK**)]; EASTERN: Chaiyaphum [Ban Khwae, 6 Jan. 1970, *Lekakul 34* (**BKF**); Muang, 12 Jan. 1970, *Lekakul 62* (**BKF**); Nam Phrom, 10 Dec. 1971, *Beusekom et al. 4101* (**BKF, C, L**)]; SOUTH-WESTERN: Uthai Thani [Huai Kha Khaeng WS, 2 Feb. 1976, *Maxwell 76-55* (**AAU, BK, L**)]; Kanchanaburi [Sai Yok, 19 Feb. 2000, *Maxwell 00-69* (**BKF, L**); Mon Bala Ming, 12 Feb. 2003, *Bult 637* (**BKF**)]; Phetchaburi [Kaeng Krachan NP, 3 Dec. 1993, *Larsen et al. 45109* (**AAU**); *ibid.*, 14 Dec. 2002, *Middleton et al. 1635* (**AAU, BKF, E**)]. Fig. 2D.

Distribution.— Myanmar, Vietnam.

Ecology.— In shaded mixed deciduous forest, hill evergreenforest, sandy soil, 300–1000 m alt.

Phenology.— Flowering in October–January.

Vernacular.— Dok dai (ดอกไต่).

Notes.— This species is distinguished from other taxa in the genus by the stamens being distinctly exserted and the wavy margin of the corolla lobes.

9. *Pseuderanthemum pubescens* T.Choopan & P.J.Grote, *Nordic J. Bot.* 32(6): 806. 2014. Type: Thailand, Chanthaburi, Namtok Phlio NP, 16 Nov. 2010, *Choopan 2010-027* (holotype **BKF**!; isotype **BK**!).

Thailand.— SOUTH-EASTERN: Chanthaburi [Khao Chamao Khao Wong NP, 23 Nov. 1979, *Shimizu et al. 23402* (**BKF**), *23416* (**BKF** 2 sheets, **L**) & *23433* (**BKF** 2 sheets, **C** 2 sheets, **K, L** 2 sheets); *ibid.*, 24 Nov. 1979, *Shimizu et al. 23551* (**BKF**); *ibid.*, 8 Nov. 1994, *Maxwell 94-1204* (**BKF, L**); *ibid.*, 17 Nov. 2010, *Choopan 2010-036* (**BKF**)]; Khao Sa Bap, Phliew waterfall, 7 Nov. 1993, *Larsen et al. 44294* lefthand specimen (**AAU**); Namtok Phlio NP, 16 Nov. 2010, *Choopan 2010-027* (**BK, BKF**)]. Fig. 3A.

Distribution.— Endemic.

Ecology.— In shaded mixed deciduous forest with bamboo and evergreen forest, 100–500 m alt.

Phenology.— Flowering in October–December.

Vernacular.— Miat nok khon (เหมียนตอกขน).

Notes.— This species is distinguished from *Pseuderanthemum longistylum* by leaves being pubescent instead of glabrous. The corolla lobes of *P. pubescens* are purple with reddish purple dots on all 5 lobes in contrast to the corolla lobes of *P. longistylum*, which are purple with reddish purple dots on 1–3 lobes of the lower lip.

10. *Pseuderanthemum siamense* J.B.Imlay, *Bull. Misc. Inform. Kew* 1939: 134. 1939. Type: Thailand, Nan, Doi Pha Ngua, 21 Feb. 1922, *Garrett 141* (lecto-type **BKF** [SN214423!], designated by Imlay (1939); isolectotype **K** [K000885583!, K000885584!]).

Thailand.— NORTHERN: Chiang Mai [Chiang Dao, 8 Mar. 1965, *Chermsirivathana 315* (**BK, BKF**); *ibid.*, 23 Mar. 2011, *Choopan 2011-191* (**BKF**); Doi Suthep-Pui NP, 9 Apr. 1911, *Kerr 1779* (**BM, K**); *ibid.*, 12 Apr. 1912, *Kerr 2543* (**BM, E, K**); Nan [Doi Ngua, 21 Feb. 1922, *Garrett 141* (**BKF, K** 3 sheets)]; Phrae [Wiang Ko Sai NP, 20 Mar. 2011, *Choopan 2011-177* (**BKF**)]; Phitsanulok [Phu Hin Rong Kla NP, 10 Jan. 2011, *Choopan 2011-118* (**BKF**)]. Fig. 3B.

Distribution.— Endemic.

Ecology.— In shaded hill evergreenforest, 400–1200 m alt.

Phenology.— Flowering in December–January.

Vernacular.— Khem bai daeng (เข็มใบแดง).

Notes.— This species is distinguished from the others by the leaves having red veins.

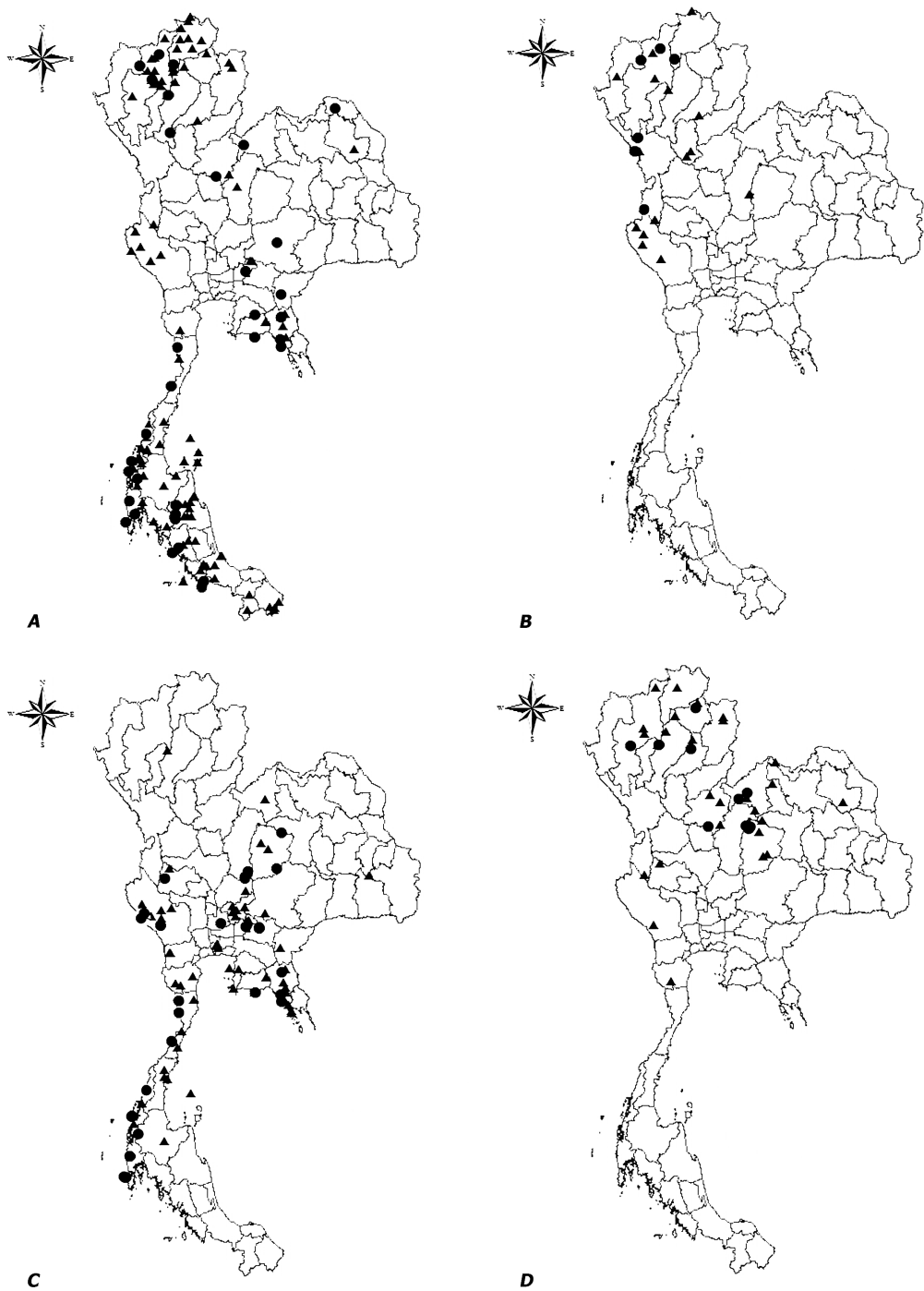


Figure 2. Distribution of *Pseuderanthemum* in Thailand: A. *P. graciliflorum*; B. *P. latifolium*; C. *P. longistylum*; D. *P. parishii*. Circular symbols indicate field collection citation; triangular symbols indicate herbarium citation.

11. *Pseuderanthemum thailandicum* T.Choopan & P.J.Grote, **sp.nov.** Type: Thailand, Kanchanaburi, Khao Laem NP, 1 Mar. 2014, *Choopan 2014-004* (holotype **BKF!**; isotype **BK!**). Figs. 3C, 4–5.

Similar to *Pseuderanthemum latifolium* (Vahl) B.Hansen but differs in: leaves leathery-crispy with deep reddish-purple coloration on the whole lower leaf surface (vs green); outer corolla surface and the top of ovary glabrous (vs puberulous).

Perennial herb up to 50 cm tall, erect, rarely branched, glabrous. *Leaves* opposite-decussate; petioles greenish purple, 1–3 cm long, glabrous; blade elliptic, mature leaves greenish purple or rarely reddish purple above with reddish purple below, leathery-crispy, 8–20 by 3–7 cm, acute at apex, cuneate at base, glabrous, with secondary veins in 7–8 pairs, opposite or alternate. *Inflorescence* terminal or axillary racemes or panicle, > 15 cm long with distantly arranged flowers, branched, 2–3 florets in each node, rachis reddish purple, with glandular hairs; bracts 2, linear, reddish purple, 3–5 by 1.5–2 mm; pedicels 1–5 mm long; bracteoles 2, linear, reddish purple, 2–3 by 0.5 mm, attenuate. *Flowers* 2–3 by 2–2.5 cm, zygomorphic. *Calyx* lobes 5, greenish purple, 5–6 mm long, with glandular hairs. *Corolla* salverform, lobes 5 (2 adaxial, 3 abaxial), purple with reddish-purple dots on yellowish white area on middle lobe of abaxial lip, elliptic to ovate, 1–1.5 by 0.5–0.7 cm, obtuse at apex. *Stamens* 2, slightly exerted, anthers oblong, purple, 1.5–2 mm long, filaments 3–4 mm long; staminodes 2, ca 1 mm long. *Ovary* cylindrical, glabrous; style purple, 2.3–2.8 cm long, glabrous. *Fruit* capsular, brown, 1.8–2.5 by 0.4–0.5 cm, with glandular hairs. *Seeds* 4 per capsule, brown, semi-circular or orbicular, with hilar side truncate, 3–5 mm in diameter, reticulate ridges on seed coat.

Thailand.— SOUTH-WESTERN: Kanchanaburi [Sai Yok NP, 8 Feb. 1962, *Larsen 9644* (C 2 sheets); *ibid.*, 13 May 2011, *Choopan 2011-227* (**BKF**); Khao Laem NP, 1 Mar. 2014, *Choopan 2014-004* (**BK**, **BKF**); PENINSULAR: Ranong [Thung Raya-Nasak WS, 25 May 2011, *Choopan 2011-316* (**BKF**)].

Distribution.— Known only from Thailand.

Ecology.— In shaded evergreen forest along stream, 100–400 m alt.

Phenology.— Flowering in December–January.

Vernacular.— Khem bai muang (เข็มใบม่วง).

Etymology.— Named in honour of the country, Thailand.

Notes.— This species differs from *Pseuderanthemum latifolium* and *P. siamense* by the leathery-crispy leaves with deep reddish-purple colour on the whole lower leaf surface, and by its differing ecology, growing along streams. In addition, this species has the outer corolla surface and the top of the ovary glabrous instead of puberulous in *P. latifolium*. It has been found only in shaded evergreen forest along streams at 100–500 m a.s.l. in South-western and Peninsular floristic regions, while the other two species have larger geographic ranges, distributed farther north, and greater altitudinal ranges, 300–1200 m alt, reaching to hill evergreen forest in parts of the South-western and Northern floristic regions.

INTRODUCED SPECIES

12. *Pseuderanthemum carruthersii* (Seem.) Guillaumin, Ann. Mus. Colon. Marseille 5–6: 48. 1948; Y.F.Deng *et al.*, Fl. Hong Kong 3: 178. 2009.— *Eranthemum carruthersii* Seem., Fl. Vitiensis: 185. 1866. Type: Vanuatu, Aneitum and Eromanga; *McGillivray s.n.* (lectotype **BM** [BM001041151!], designated by Guillaumin (1948); isolectotype **P** [no barcode]).

— *Eranthemum atropurpureum* W.Bull, Gard. Chron., ser. 3: 619. 1875.— *Pseuderanthemum atropurpureum* (W.Bull) Radlk., Sitzungsber. Math.-Phys. Cl.Königl. Bayer. Akad. Wiss. München 13(1): 286. 1883.— *Pseuderanthemum carruthersii* var. *atropurpureum* (W.Bull) Fosberg, Smithsonian Contr. Bot. 45: 26. 1980. Type: Cultivated in England?; *Bull s.n.*

Thailand.— NORTH-EASTERN: Maha Sarakham [Chiang Yuen, 19 Apr. 2009, *Choopan 2011-322* (**BKF**); EASTERN: Nakhon Ratchasima [Mueang, Jan. 2010, *Choopan 2011-323* (**BKF**); CENTRAL: Bangkok [June 1954, *Smitinand 2808* (**BKF**); 7 Jan. 1958, *Sørensen et al.* 40 (C); 3 Dec. 1969, *Maxwell s.n.* (**BK**, L); Klong San, Thonburi, 7 Nov. 1970, *Maxwell s.n.* (L)].

Distribution.— Australia, New Caledonia.

Ecology.— Unknown.

Phenology.— Flowering in April–June.

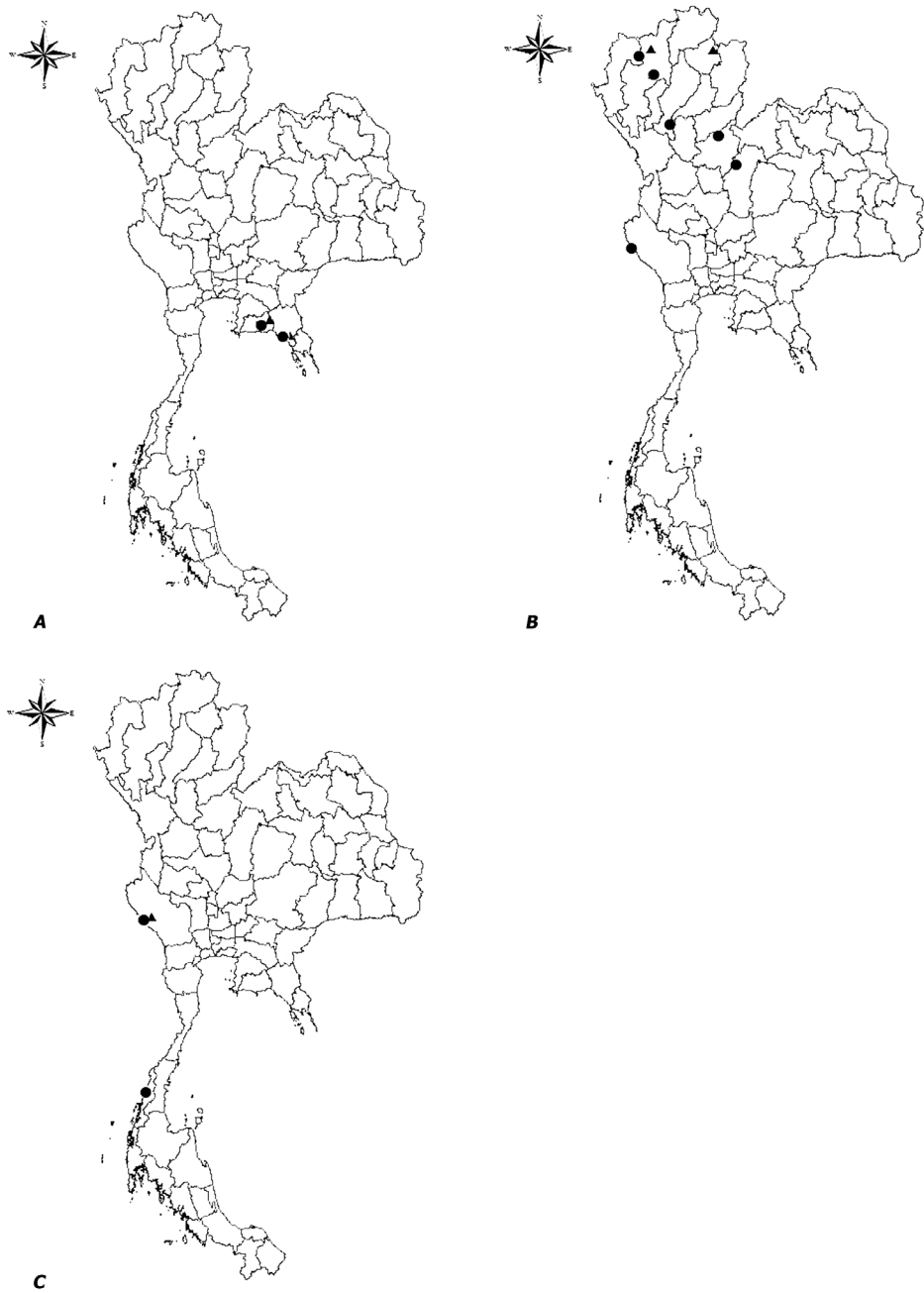


Figure 3. Distribution of *Pseuderanthemum* in Thailand: A. *P. pubescens*; B. *P. siamense*; C. *P. thailandicum*. Circular symbols indicate field collection citation; triangular symbols indicate herbarium citation.

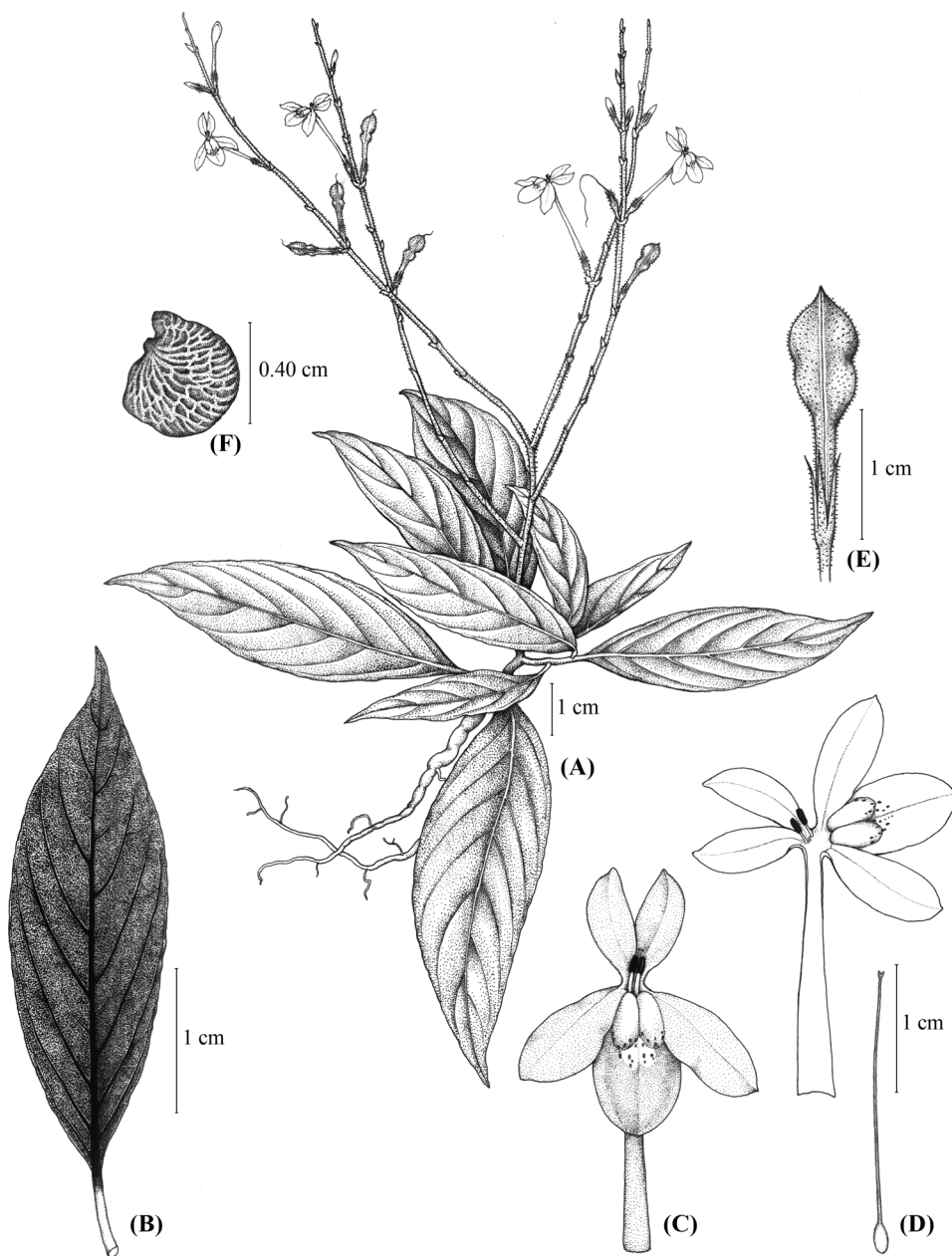


Figure 4. *Pseuderanthemum thailandicum* T.Choopan & P.J.Grote.: A. habit; B. abaxial leaf surface; C. flower; D. pistil and stamens; E. fruit; F. seed.



Figure 5. *Pseuderanthemum thailandicum* T.Choopan & P.J.Grote: A–B. habit; C. abaxial leaf surface; D–E. flower; F. seed; G. dried fruit and seeds; H. immature fruit.

Uses.— Introduced and cultivated as ornamental and cultural plants. Long used by people in several parts of Thailand as a sacred plant especially in wedding and other ceremony, as it brings luck and wealth to.

Vernacular.— Bai ngoen (ใบเงิน), bai thong (ใบทอง), bai nak (ใบนาค) (General).

Notes.— Two distinct cultivated forms are found in Thailand, i.e. (1) asymmetric elliptic-leaf plants and (2) symmetric ovate-leaf plants.

13. *Pseuderanthemum lanceophyllum* T.Choopan, **sp. nov.** Type (cultivated): Thailand, Yasothon, Kho Wang, 11 Mar. 2012, *Sittisart 1* (holotype **BKF** [SN190960!]); isotype **BKF** [SN190961!]). Figs. 6–7.

— *Pseuderanthemum palatiferum* sensu P.H.Hô, *Câyco Vietnam* 3: 77. 1993.

Similar to *P. graciliflorum* (Nees) Ridley but differs by the corolla being white, with yellow patches on midlobe of abaxial lip, corolla lobes narrower, and by the flowers being solitary or rarely 2 or 3 in each bract, leaves being lighter green, lanceolate, with wavy surfaces.

Shrubs, up to 3m tall, erect, branched, puberulous. *Leaves* opposite-decussate; petioles 1–2 cm long, puberulous; blade lanceolate, 10–12 by 3–4 cm, acute or acuminate at apex, acute or acuminate at base, puberulous, with secondary veins in 5–8 pairs, opposite or alternate. *Inflorescence* terminal or axillary cymes or panicle, branched, 2–3 florets in each node; bracts 2, oblong to elliptic, 2–3 by 1 mm; pedicels ca 5 mm long; bracteoles, linear, 2–3 by 0.5 mm, attenuate. *Flowers* 2–3 by 1.5–2 cm, zygomorphic. *Calyx* lobes 5, 5–6 mm long, puberulous. *Corolla* salverform, lobes 5 (2 adaxial, 3 abaxial), white, elliptic, 8–10 by 4–5 mm, obtuse at apex, puberulous. *Stamens* 2, slightly exserted, anthers oblong, ca 1.5 mm long, filaments 3–5 mm long, glabrous; staminodes 2, ca 1 mm long. *Ovary* cylindrical, puberulous; style 2.5–3 cm long, puberulous. *Fruits* not seen.

Thailand.— NORTH-EASTERN: Maha Sarakham [Chiang Yuen, 12 Oct. 2011, *Choopan 2011-328* (**BKF**)]; EASTERN: Yasothon [Kho Wang, 11 Mar. 2012, *Sittisart 1* (**BKF** 2 sheets)].

Distribution.— Laos, Vietnam (Hô, 1993).

Ecology.— Unknown.

Phenology.— Flowering in December–January.

Uses.— Introduced and cultivated as medicinal plants.

Vernacular.— Phaya wanorn (พญาวานร), wan ngok (ฮว่านจ๊อก) (General).

Etymology.— Refers to its leaf-shape.

Notes.— This species is distinguished from other taxa by the corolla being white, with yellow patches on the midlobe of the abaxial lip. Further, it is distinguished by the leaves being lighter green and lanceolate with wavy surfaces.

Pseuderanthemum lanceophyllum is quite well known for Vietnamese medicinal plant under the name “Wan Ngoc” or “Huan Ngoc” and usually misidentified as *P. palatiferum*, a synonym of *P. latifolium*. However this new species is easily recognized by its white corolla with yellow patches on the midlobe instead of purple corolla with dark purple dots in *P. latifolium*.

14. *Pseuderanthemum laxiflorum* (A.Gray) F.T.Hubb. ex L.H.Bailey, *Rhodora* 18(211): 159. 1916.— *Eranthemum laxiflorum* A.Gray, *Proc. Amer. Acad. Arts.* 5: 349. 1862.— *Pseuderanthemum laxiflorum* (A.Gray) F.T.Hubb. in Fosberg, *Smithsonian Contr. Bot.* 45: 26. 1980. Type: Fiji, Viti Levu, *Graeffe s.n.* (lectotype **BM** [BM001041147!], designated by Gray (1862); isolectotype **GH** [GH00055082!]).

Thailand.— EASTERN: Nakhon Ratchasima [Mueang, 25 Nov. 2011, *Choopan 2011-324* (**BKF**)].

Distribution.— Fiji.

Ecology.— Unknown.

Phenology.— Flowering in September–March.

Uses.— Introduced and cultivated as ornamentals.

Vernacular.— Thep phanom (เทพพนม) (General).

Notes.— This species is distinguished from other species by having predominantly axillary cymes, flowers distinctly funnel-shaped with a wide throat, and by the flower being quite large, dark pinkish purple in color and without dots.

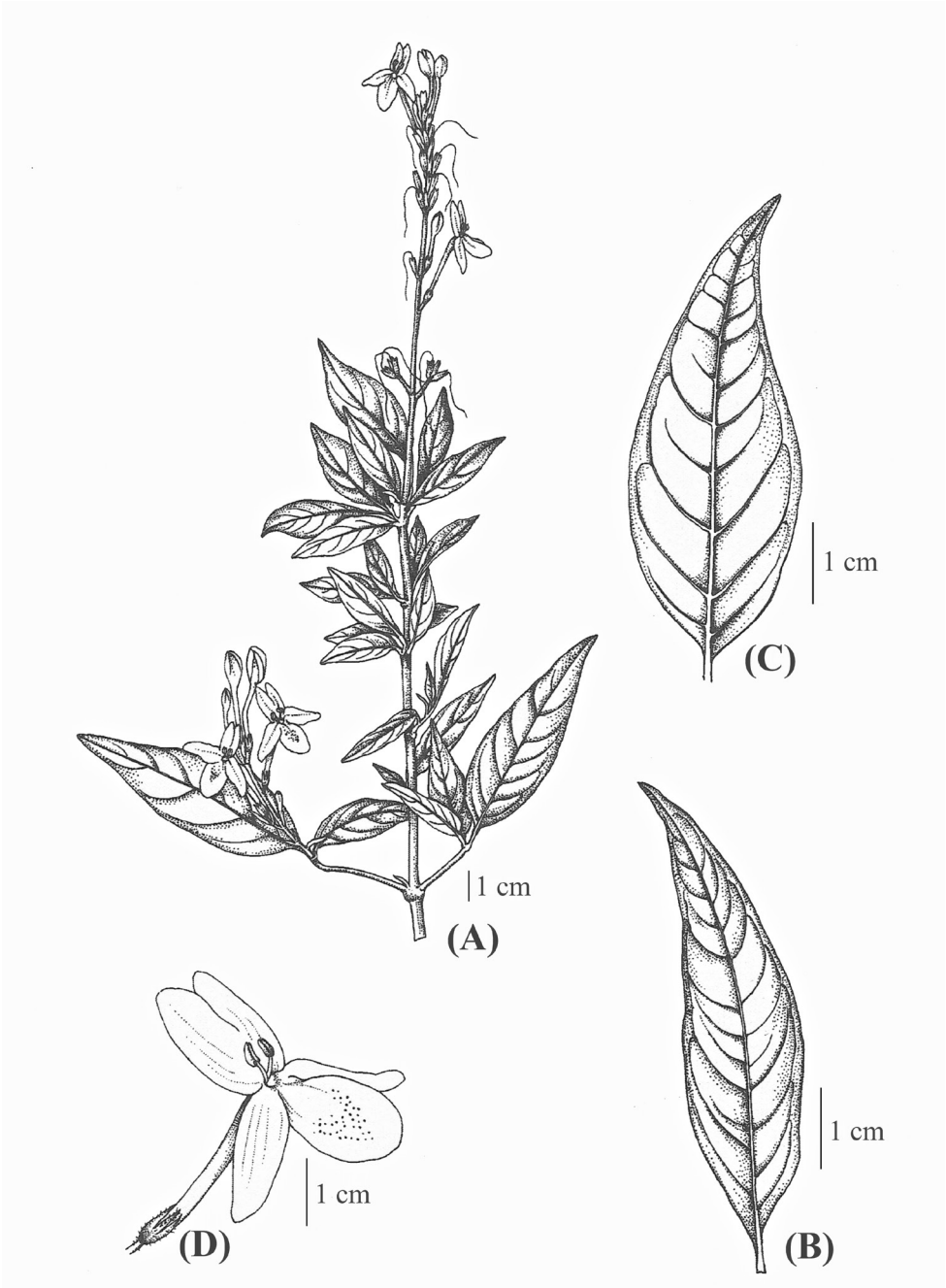


Figure 6. *Pseuderanthemum lanceophyllum* T. Choopan: A. habit; B. adaxial leaf surface; C. abaxial leaf surface; D. flower.

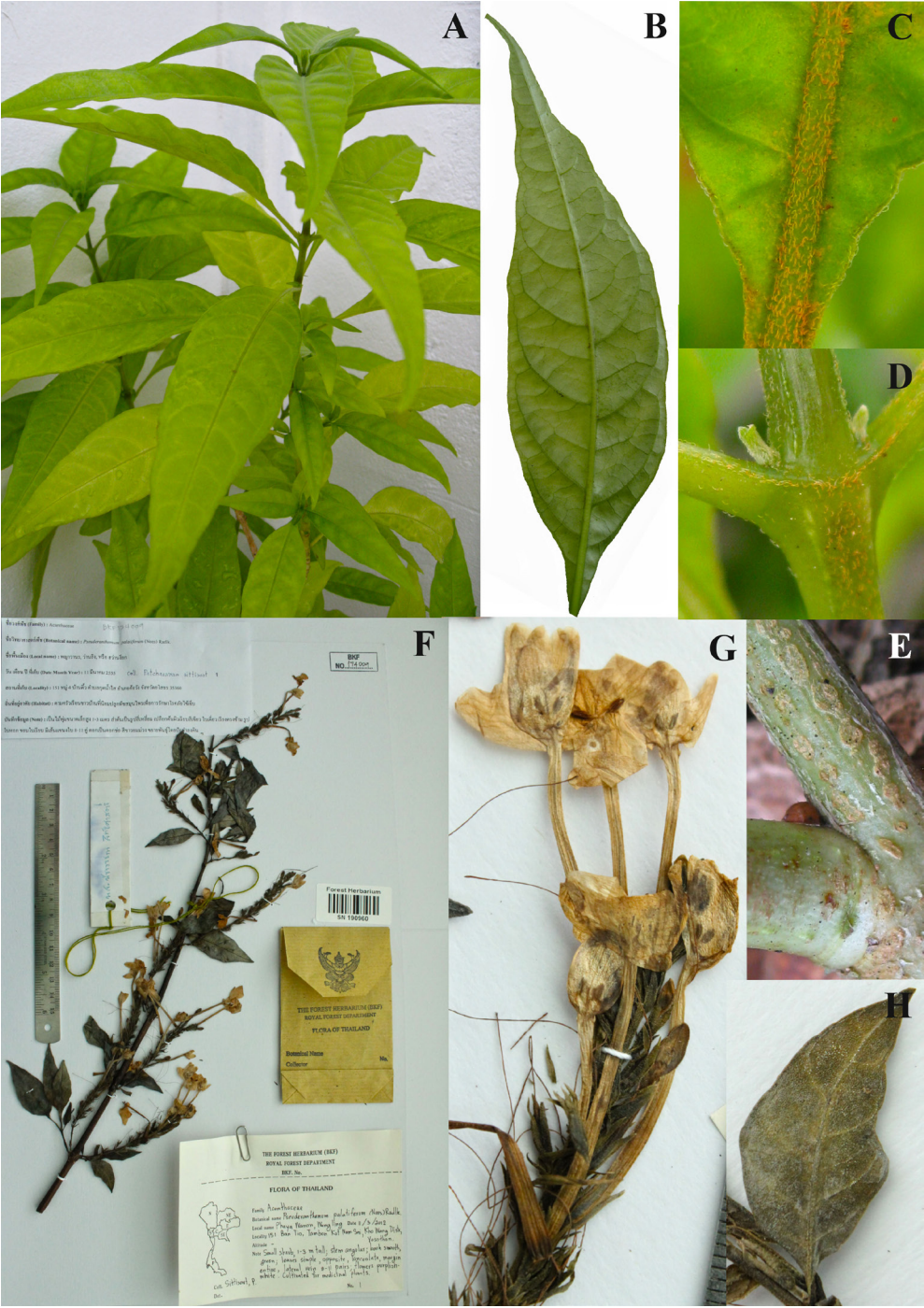


Figure 7. *Pseuderanthemum lanceophyllum* T. Choopan: A. habit; B–C. abaxial leaf surface; D–E. branches; F. holotype; G. dried flowers; H. dried leaf.

15. *Pseuderanthemum metallicum* Hallier, Ann. Jard. Bot. Buitenzorg 15: 26. 1898. Type: West Sumatra, Sungei Paguh, *Teysmann 1185* (lectotype **BO!**, designated by Hallier (1898).

Thailand.— EASTERN: Nakhon Ratchasima [Mueang, 15 Oct. 2011, *Choopan 2011-329* (**BKF**)].

Distribution.— Indonesia.

Ecology.— Unknown.

Phenology.— Flowering in April–June.

Uses.— Introduced and cultivated as ornamentals.

Vernacular.— Bai ngoen (ใบเงิน)(General).

16. *Pseuderanthemum reticulatum* (W.Bull) Radlk., Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München 13: 282. 1883; Benoist in Lecomte, Fl. Indo-Chine 4: 718. 1935.— *Eranthemum reticulatum* W.Bull, Gard. Chron. 3: 619. 1875; J.D.Hooker, Bot. Mag. 122: t. 7480. 1896.— *Pseuderanthemum carruthersii* (Seem.) Guillaumin var. *reticulatum* (W.Bull) Fosberg, Smithsonian Contr. Bot. 45: 26. 1980. Type: Java, Gekultiveerd Java, 27 Apr. 1939, *anonymous s.n.* (lectotype **L** [L0002973!], designated by Fosberg (1980).

Thailand.— NORTH-EASTERN: Maha Sarakham [Chiang Yuen, 19 Apr. 2011, *Choopan 2011-321* (**BKF**)]; Khon Kaen [20 July 2000, *Chaikong 30/43* (**KKU**)]; CENTRAL: Saraburi [Wang Noi, 27 May 2011, *Choopan 2011-320* (**BKF**)]; Bangkok [7 Mar. 1958, *Sørensen et al.* 1974 (**C**); 20 Dec. 1984, *Chirawanich 23* (**BK**); Thonburi, 7 Nov. 1970, *Maxwell 70-81* (**BK**)].

Distribution.— Indonesia.

Ecology.— Unknown.

Phenology.— Flowering in April–June.

Uses.— Introduced and cultivated as ornamental and cultural plants. Used as a sacred plant in many ceremonies as in *P. carruthersii*.

Vernacular.— Ratsamee chan (รัศมีจันทร์), Saeng Chan Lek (แสงจันทร์เล็ก) (General).

Notes.— Two distinct cultivated forms are found in Thailand, i.e. (1) asymmetric elliptic-leaf plants and (2) symmetric ovate-leaf plants.

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