Tropical Natural History 10(1): 81-92, April 2010

A Revision of the Genus *Rotheca* Raf. (Lamiaceae) in Thailand

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Received: 9 October 2009; Accepted: 22 March 2010

ABSTRACT.– A revision of the genus *Rotheca* in Thailand is presented. Three species are enumerated including one endemic and one introduced species. The new combination *Rotheca vanprukii* (Craib) C. Leeratiwong & P. Chantaranothai is made. Two taxa, *C. farinosum* Wall. ex Walp. var. *pubescens* ((H.R. Fletcher) C. Leeratiwong & P. Chantaranothai and *C. serratum* (L.) Moon var. *amplexifolium* Moldenke are reduced to be the synonymy of *R. serrata* (L.) Steane & Mabb. A key to species, morphological, ecological and distributional data, vernacular names and some illustrations are provided.

KEY WORDS: revision, *Rotheca*, Lamiaceae, new combination, Thailand

INTRODUCTION

Rotheca (Lamiaceae) was described by Rafinesque (1838) based on *R. ternifolia*. However, the earliest described species now included in the genus is *Rotheca serrata* (L.) Steane & Mabb., originally named by Linnaeus in 1767 as *Volkameria serrata*. This genus comprises some 50 - 60 species worldwide and is widespread throughout sub-Saharan Africa, Madagascar, Indian Ocean islands and tropical Asia, east to Moluccas (Steane and Mabberley, 1998 and Harley et al., 2004). In the past, *Rotheca* had been reduced as a synonym of *Clerodendrum* L. by many botanists. However, Steane and Mabberley (1998) and Harley et al. (2004) recognized *Clerodendum* subgen. *Cyclonema* (Hochst.) Gürke and *Clerodendrum* sect. *Konocalyx* Verdcourt as a separate genus *Rotheca*. Morphologically the two genera, *Rotheca* and *Clerodendrum* are compared in Table 1.

In Thailand, preliminary studies or checklists of the genus *Rotheca* (as *Clerodendrum*), report two to eight taxa (Fletcher (1938), Moldenke (1980), The Forest Herbarium (2001) and Govaerts et al. (2009)). However, these previous works did not provide descriptions, key to species, nor did they resolve problems of doubtful or unknown species, synonymy and misidentification of species, therefore it is necessary to provide a complete revision of *Rotheca* in Thailand in preparation for an account of the Lamiaceae for the flora of Thailand.

MATERIALS AND METHODS

The account of *Rotheca* is presented as a precursor for the Thai Lamiaceae in the Flora of Thailand. Each species was examined and compared with the available literatures, field-collected and herbarium materials at the following herbaria: Department of Systematic Botany, University of Aarhus (AAU), University of Aberdeen Herbarium (ABD), Kasin Suvathabandhu Herbarium, Chulalongkorn University (BCU); Bangkok Herbarium, Department of Agriculture, Bangkok (BK), Forest Herbarium, Bangkok (BKF), British Natural History Museum (BM), Botanical Museum, University of

TABLE 1. Comparison of the genera *Rotheca* and *Clerodendrum*.

Characters	*Rotheca*	*Clerodendrum*
Flower bud	Markedly asymmetrical	Both symmetrical and asymmetrical
Corolla	Expanding abruptly on lower side only	If asymmetrical, usually expanding abruptly on the upper side due to resupination
Anterior corolla lobe	Frequently much larger than the others	Only slightly (if at all) larger than the others
Anthers	Usually basifixed (occasionally approaching versatile)	Versatile
Stigma lobes	Frequently unequal	Eequal

Copenhagen (C), Chiangmai University Herbarium (CMU), Royal Botanic Garden, Edinburgh (E), Royal Botanic Gardens, Kew (K), Khon Kaen University Herbarium (KKU), National Herbarium Netherland University of Leiden branch (L), Linnean Society Herbarium (LINN), The New York Botanical Garden Herbarium (NY), Prince of Songkla University Herbarium (PSU), Queen Sirikit Botanical Gardens Herbarium (QBG), Muséum National d'Histoire Naturelle, Paris (P), Department of Botany, Herbarium and Nature Reserve, Singapore (S) and Department of Biology Herbarium, Chiang Mai University. Herbaria are abbreviated according to the Index Herbariorum (Holmgren and Holmgren, 1998). Morphological, ecological and distributional data were also recorded.

SYSTEMATICS

Rotheca Raf.

Rotheca Raf., Fl. Tell. 4: 69. 1838; Steane and Mabb., Novon 8: 204. 1998. Type species: *Rotheca ternifolia* Raf. (lectotype).

Cyclonema Hochst., Flora 25: 225. 1842. Type: *Cyclonema myricoides* (Hochst.) Hochst.

Spironema Hochst., Flora 25: 226. 1842, *nom. illeg*.

Cyrtostemma Kunze, Bot. Zeitung (Berlin) 1: 272. 1843.

Clerodendrum L. sect. *Cyclonema* (Hochst.) Guerke in Engl., Pflanzenw. Ost-Afrikas C: 341. 1895. Type: as *Cyclonema myricoides* (Hochst.) Hochst.

Clerodendrum subg. *Cyclonem*a (Hochst.) Thomas in Engl., Bot. Jahrb. Syst. 68: 22. 1936. Type: as *Cyclonema myricoides* (Hochst.) Hochst.

Shrub or small tree. *Stem and twigs* mostly quadrangular and pubescent. *Leaves* simple, decussate rarely whorled (three leaves, ternate), usually petiolate or sessile; exstipulate. *Inflorescence* thyrsoid, terminal or rarely cymes in axils of leaf-like bracts; bracteoles present. *Flowers* bisexual, zygomorphic; flower bud markedly asymmetrical. *Calyx* of five fused sepals, actinomorphic or nearly so, campanulate or cup-shaped, five-lobed or truncate, persistent. *Corolla* of five fused petals, blue, purple, white or whitish-purple, zygomorphic, expanding abruptly on lower side; tube swollen, erect or curved; lobes five, unequal, anterior lobe much larger, often more concave and more different in colour than other four. *Stamens* four, didynamous, inserted in the corolla tube; filaments long exserted,

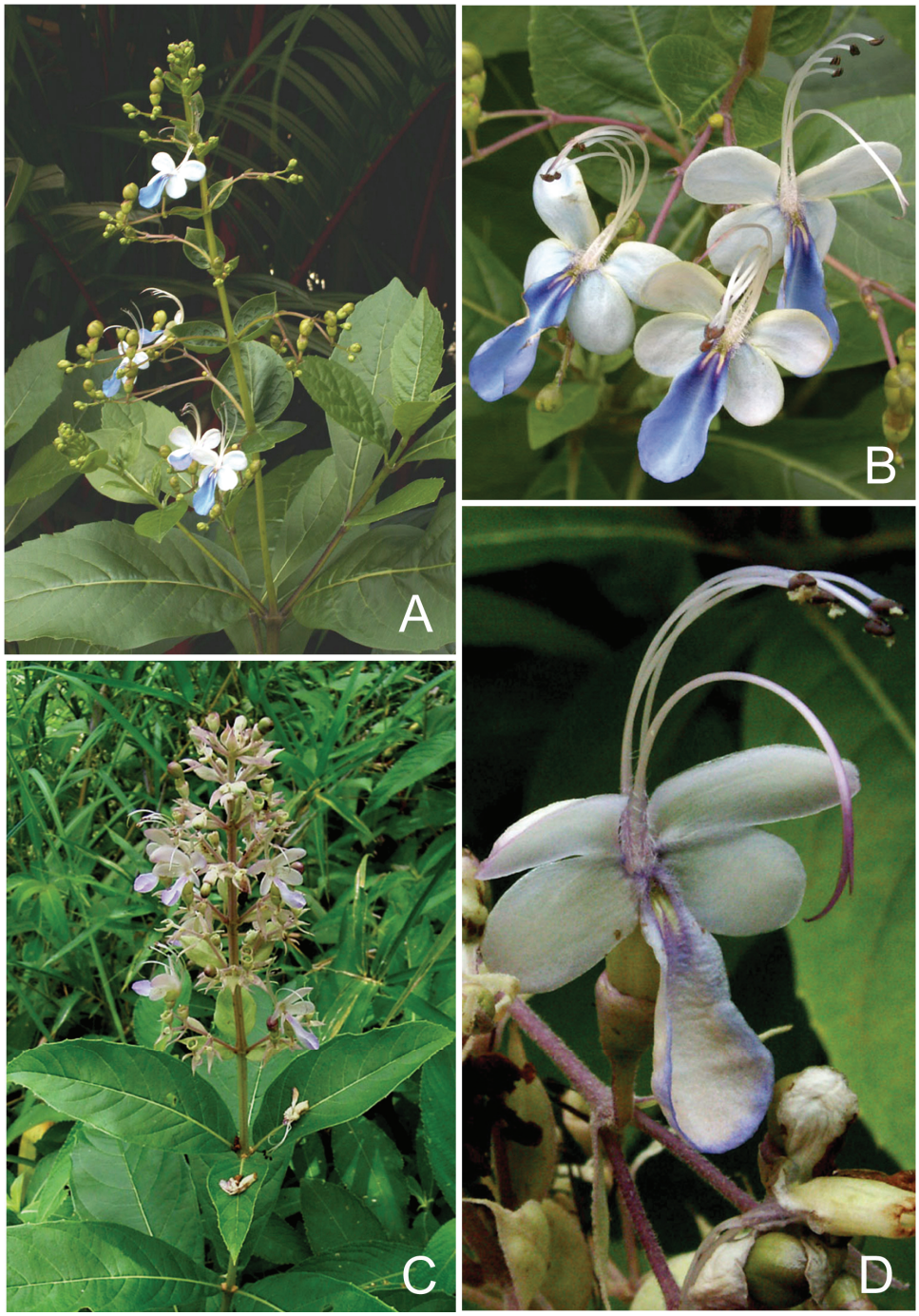

Figure 1. *Rotheca myricoides* A - B.: **A.** flowering branch, **B.** flowers; *Rotheca serrata* C - D.: **C.** flowering branch, **D.** flower. Photographed by C. Leeratiwong.

alternate with corolla lobes; anthers basifixed, two-lobed; each lobe opening by a longitudinal slit. *Ovary* superior, bicarpellary, syncarpous, four-locular, with one ovule in each cell, unlobed in flower, but becoming shallowly four-lobed during fruit develop; style terminal, long exserted, glabrous; stigma with two acute lobes, unequal**.** *Fruit* a one- to four-lobed drupe, each lobe containing a single-seeded endocarp. *Seeds* exalbuminous.

There are 50 to 60 species and widely distributed in sub-Saharan Africa, Madagascar, Indian Ocean islands and tropical Asia, east to Moluccas. Three species are numerated in Thailand.

KEY TO SPECIES

1. Calyx truncate or with five minute teeth, teeth less than 0.8 mm long…..*R. serrata*
1. Calyx with five distinct teeth; teeth 0.8 - 2 mm long……..2
2. Exclusively cultivated plant; calyx lobe apices obtuse or rounded, with hairs; leaf blade chartaceous to subcoriaceous, 6 - 16 cm long, leaf margins shallowly serrate…….*R. myricoides*
2. Wild plant; calyx lobe apices acute, without hair; leaf blade membranous, 18 - 25 cm long, leaf margins deeply serrate ……..…….…..*R. vanprukii*

***Rotheca myricoides* (Hochst.) Steane & Mabb.**
(Figures 1A, B)

Rotheca myricoides (Hochst.) Steane & Mabberly, Novon 28(2): 205. 1998. Type: as *Spironema myricoides* Hochst.

Spironema myricoides Hochst., Fl. Abyss. Exsicc. Unio Itin. 1: 330. 1840. Type: Ethiopia, Mt. Scholoda, *Schimper* 330 (holotype TUB; isotypes BM, K, OXF).

Cyclonema myricoides (Hochst.) Hochst., Flora 25: 226. 1842. Type: as *Spironema myricoides* Hochst.

Clerodendrum myricoides (Hochst.) R. Br. ex Vatke, Linnaea 43: 535. 1882. Type: as *Spironema myricoides* Hochst.

Siphonanthus myricoides (Hochst.) Hiern., Cat. Afr. Pl, Welw. 1: 844. 1900. Type: as *Spironema myricoides* Hochst.

Clerodendrum ugandense Prain in Curtis, Bot. Mag.: t. 8235. 1909; Back. & Bakh.f., Fl. Java 2: 608. 1965. Type: Bot. Mag. t. 8235. 1909, drawn from material cultivated by *M.T. Dawe* at the Royal Botanic Gardens, Kew, grown from seed sent from Uganda (K!).

Shrub 0.5 – 2 m tall, branches four-angled or slightly terete, lenticellate, sparsely, brownish-grey pubescent or glabrescent. *Leaves* opposite-decussate or ternate; blade chartaceous or subcoriaceous, elliptic, ovate-elliptic, obovate, oblong-ovate or lanceolate-elliptic, 6 – 16 x 3.5 – 6.5 cm, apex acuminate or acute, base cuneate or attenuate, margin usually serrate or slightly serrate; both surfaces glabrous, with subsessile glands or sometimes with pubescent hairs on midrib or margins; secondary veins 8- to 10-paired, prominent on abaxial surface; tertiary veins reticulate, prominent on abaxial surface; petiole 3 – 15 mm long, swollen, with pale brown pubescent hairs. *Inflorescences* terminal or axillary, 5 – 15 cm long; peduncles 1.5 – 4 cm long, four-angled, swollen at base, with whitish-brown pubescent hairs; pedicels 3 – 8 mm long, swollen, with pale brown pubescent hairs; bracts ovate or cordate, 7 – 25 x 4 – 20 mm; bracteoles linear-oblong,

lanceolate-oblong or linear, 3 - 8 x 1.5 - 5 mm. *Calyx* cup-shaped, green with purple at apex, 3 – 4.5 mm long, sparsely, whitish-brown pubescent outside, glabrous with several subsessile glands inside; tube 2.5 – 3 mm long; lobes ovate or triangular-ovate, 0.8 – 1.5 x 1 – 2 mm, apex obtuse or rounded with pubescent hairs. *Corolla* whitish-blue, with anterior lobe blue; tube 7 – 9 mm long, swollen, oblique throat becoming s-shaped, glabrous or sparsely pubescent outside, white villose inside; lobes oblong, ovate-oblong or obovate, 10 – 16 x 6 – 10 mm, subcoriaceous, apex obtuse, with whitish-brown glandular hairs at margins outside, densely, villose at base inside. *Stamens* white or whitish-blue, cylindrical, swollen, with villose hairs at base; short filaments 2.4 – 2.8 cm long; long filaments 2.7 – 3.5 cm long; anthers brown or blackish-brown, ovate, 1.8 - 2 mm long. *Ovary* elliptic-ovate, 2 – 3 mm long; glabrous; style whitish, slightly swollen at base or apex, 2.8 – 3.2 cm long; stigma white, short branch 1.5 – 2.5 mm long; long branch 3.5 – 5 mm. *Fruits* unseen.

Thailand.– NORTHERN: Chiang Mai; NORTH-EASTERN: Khon Kaen; CENTRAL: Krung Thep Maha Nakhon; PENINSULAR: Songkhla.

Distribution.– Central and east to northeast tropical Africa.

Ecology.– Cultivated and grown mainly for its ornamental value; flowering and fruiting May-August.

Vernacular.– Phee Sue, Phee Sue Taiwan, Phee Sue Sansuay (Central), common name: Blue butterfly bush, blue glorybower.

Note.– *Rotheca myricoides* is distinct in having calyx lobes which are ovate or triangular-ovate, obtuse or rounded at apex and covered with hairs at the margins.

***Rotheca serrata* (L.) Steane & Mabb (Figures 1C, D and 2)**

Rotheca serrata (L.) Steane & Mabb., Novon 8(2): 206. 1998. Type: as *Volkameria serrata* L.

Volkameria serrata L., Mant. 1: 90. 1767. Type: India, *Herb. Linnaeus* 809-5 (holotype LINN, microfiche!)

Clerodendrum divaricatum Jack, Malayan Misc. 1: 48. 1820. Type: not designated.

Clerodendrum serratum (L.) Moon, Cat. Pl. Ceylon: 46. 1824; Blume, Bijdr. Fl. Ned. Ind.: 810. 1826; Walp., Repert. Bot. Syst. 4: 106. 1845; King & Gamble, J. Asia. Soc. Beng. 74: 834. 1909 & Mat. Fl. Malay Penins.: 1044. 1909; Back. & Bakh.f., Fl. Java 2: 608. 1965; Moldenke & A.L. Moldenke in Dassan. & Fosberg, Rev. Handb. Fl. Ceyl. 4: 417. 1983; Chen & Gilbert in W.Z. Yi & P.H. Raven, Fl. China 17: 42. 1994; A. Rajendran & P. Daniel, Ind. Verbenaceae: 139. 2002. Type: as *Volkameria serrata* L.

Clerodendrum macrophyllum Sims in Curtis, Bot. Mag. 52: t. 2536. 1824. Type: Bot. Mag. t. 2536. 1824, drawn from material cultivated by R. Barclay at Bury Hill, Surrey, England, grown from seed sent from Mauritius (K).

Clerodendrum ternifolium D. Don, Prodr. Fl. Nepal.: 103. 1825. Type: Sirinagur, *Kamroop* s.n. (holotype BM).

Rotheca bicolor Raf., Fl. Tellur. 4: 69. 1838, nom. illeg.

Rotheca ternifolia Raf., Fl. Tellur. 4: 69. 1838, nom. illeg.

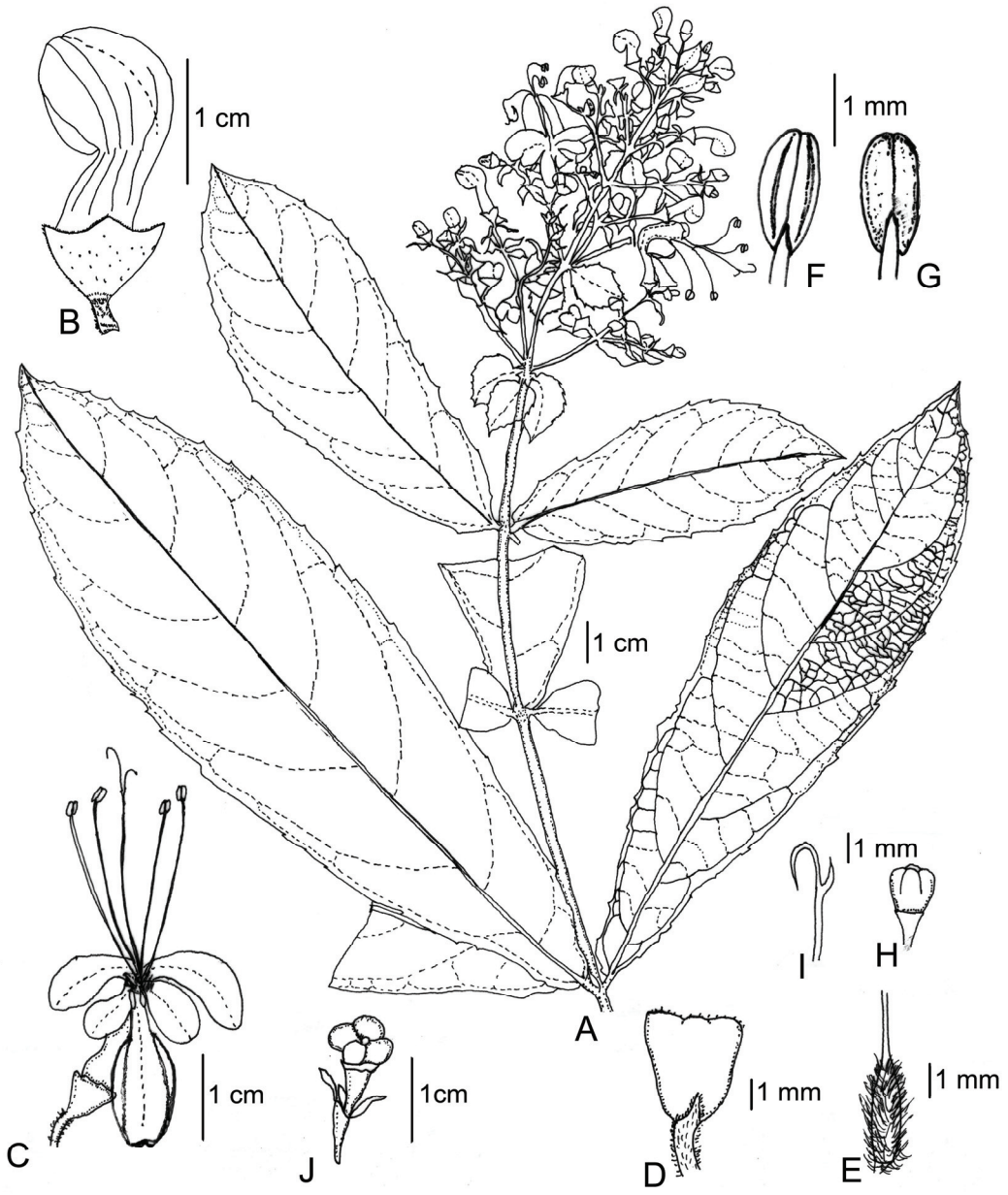

Figure 2. Drawing of *Rotheca serrata*: **A.** flowering branch; **B.** flowering bud; **C.** mature flower: representing zygomorphic form, expanding abruptly on the lower side and anterior lobe much larger than the other four; **D.** calyx; **E.** the filament base covering with hairs; **F.** ventral view of anther; **G.** dorsal view of anther; **H.** ovary; **I.** unequal stigma branches; **J.** four-lobed drupe.

Cyclonema serratum (L.) Hassk., Pl. Jav. Rar.: 489. 1848. Type: as *Volkameria serrata* L.

Clerodendrum cuneatum Turcz., Bull. Soc. Imp. Naturalistes Moscou 36: 221. 1863. Type: Srilanka, *Gardner* s.n. (Holotype LE).

Clerodendrum serratum var. *wallichii* C.B. Clarke in Hook.f., Fl. Brit. India 4: 592. 1885; King & Gamble, J. Asia. Soc. Beng. 74: 834. 1909 & Mat. Fl. Malay Penins.: 1044. 1909; H.R. Fletcher, Bull. Misc. Inform., Kew 1938: 429. 1938; Chen & Gilbert in W.Z. Yi & P.H. Raven, Fl. China 17: 42. 1994. Type: Bangladesh, Silhet, *Wallich* Cat. No. 1810.1 (holotype K-W!).

Clerodendrum serratum (L.) Spreng., Syst. Veg. 2: 758. 1825; Clarke in Fl. Brit. India 4: 592. 1885; Kurz, Fl. Burm. 2. 1887; Brandis, Ind. Trees: 508. 1906; H.J. Lam, Verbenac. Malay. Arch.: 267. 1919; Bakh. in H.J. Lam & Bakh., Bull. Jard. Bot. Buitenzorg, ser. 3, 3: 78. 1921; Ridl., Fl. Malay Penins. 2: 626. 1923; Dop in Lecomte, Fl. Indo-Chine 4(7): 856. 1935; H.R. Fletcher, Bull. Misc. Inform., Kew 1938: 428. 1938; Kochummen in Tree Fl. Mal. 3: 304. 1978; Basu & Kirtikar in Ind. Med. Pl. 3: 1948. 1980. Type: as *Volkameria serrata* L.

Clerodendrum serratum var. *dentatum* H.J. Lam, Verbenac. Malay. Arch.: 269. 1919. Type: India, Sikkim, alt. 1,400 - 1,700 m, *J.D. Hooker* s.n. (holotype K).

Clerodendrum venosum Wall. var. *pubescens* H.R. Fletcher, Kew Bull. Misc. Inform., Kew 1938: 205 & 428. 1938; Moldenke, Fifth Summary Verbenac. 1: 295. 1971 & Phytologia Mem. 2: 285. 1980. Type: Thailand, Chiang Mai, Mae Tun, alt. ca. 600 m, *A.F.G. Kerr* 6190 (lectotype BK!, isotypes BM!, E!, K!).

Clerodendrum serratum var. *amplexifolium* Moldendke, Phytologia 4 (1): 51. 1952, **syn. nov.** Type: China, Yunnan, Mengtze, Aug., *A. Henry* 10077A (holotype NY**!**, isotype NY**!**).

Clerodendrum serratum var. *obovatum* Moldenke, Phytologia 35 (3): 216. 1977. Type: Thailand, Chiang Mai, Doi Chiang Dao, alt. 1,900 – 2,100 m, 26 Sept. 1971, *G. Murata, K. Iwatsuki, C. Phengklai T-15251* (holotype AAU**!**, isotypes BKF**!**, K**!**)

Clerodendrum serratum var. *pilosum* Moldenke, Phytologia 35 (3): 216. 1977. Type: Thailand, Chiang Mai, Doi Chiang Dao, alt. 1,900 – 2,100 m, 14 Sept. 1967, *T. Shimizu, H. Koyama & A. Nalampoon T-10053* (holotype AAU!, isotypes BKF!, E!, K!)

Clerodendrum farinosum Wall. ex Walp. var. *pubescens* (H.R. Fletcher) C. Leeratiwong & P. Chantaranothai, Thai. For. Bull. (Bot.) 31: 44. 2003, **syn. nov**. Type: as *Clerodendrum venosum* Wall. var. *pubescens* H.R. Fletcher.

Small tree or shrub 1 – 6 m high, branches four-angled, lenticellate, densely to sparsely, pale brown pubescent or glabrescent. *Leaves* ternate or rarely opposite decussate; blade chartaceous or subcoriaceous, elliptic, ovate, obovate, elliptic, oblong, oblong-ovate, lanceolate or lanceolate-elliptic, 6 – 28 x 1.7 – 12 cm, apex acuminate, acute or mucronate, base cuneate or attenuate, margin usually serrate or dentate, rarely entire or shallow serrate; adaxial surface glabrous or pubescent; abaxial surface glabrous or densely to sparsely, brown pubescent or glandular; secondary veins 4- to12-paired, prominent on both sides; tertiary veins reticulate, prominent on abaxial surface; petiole 0 – 4 cm long, slender or swollen, densely to

sparsely, pale brown pubescent. *Inflorescences* terminal or axillary, 12 – 50 cm long; peduncles 0.6 – 8 cm long, slender and four-angled, with densely whitish-brown pubescent hairs; pedicels 1 – 10 mm long, slightly swollen, with pale brown pubescent hairs; bracts oblong, lanceolate, ovate to ovate-oblong, or cordate, 4 – 70 x 3 – 30 mm; bracteoles elliptic, oblong, lanceolate, ovate, linear or linear-oblong, 3.5 – 15 x 0.5 – 7 mm. *Calyx* cup-shaped, greenish-purple or green, 3 - 8 mm long, sparsely whitish-brown pubescent outside, glabrous with several glands inside; tube 2.5 – 7 mm long; lobes absent or extremely short or minutely apiculate, triangular, 0.2 – 0.7 x 0.5 – 1.5 mm, apex acute, with or without hairs. *Corolla* white or purplish-white, with anterior lobe purple or whitish-blue; corolla tube 6 – 12 mm long, swollen, oblique throat becoming s-shaped, pubescent on both sides especially long hairs at the inner-side base; corolla lobes oblong, ovate-oblong or obovate, 5.5 - 15 x 3.5 – 6 mm, subcoriaceous, apex obtuse, short pubescent outside, densely, long pubescent at base inside. *Stamens* white, cylindrical, swollen, with long hairs at base; short filaments 1.5 – 3.6 cm long; long filaments 1.6 – 4 cm long; anthers brown or whitish-brown, ovate, cordate-ovate, elliptic or elliptic-oblong, 1 – 3 mm long. *Ovary* rounded-ovate or rounded, 1.5 – 4 mm long; glabrous or with dense glands at apex; style whitish, slightly swollen at base and apex, 2.3 – 3.5 cm long; stigma white, short branch 0.2 - 2 mm long; long branch 1 – 7 mm long. *Fruits* black, rounded-elliptic, ovate or ovate-rounded, 6 - 10 mm in diam., slightly separating to 2 – 4 lobes, shiny, glabrous; persistent calyx 3 – 8 mm long, swollen; seeds number 2 – 4, at 5 – 7 mm long.

Thailand.– NORTHERN: Mae Hong Son, Chiang Mai, Chiang Rai, Phayao, Nan, Lamphun, Lampang, Phitsanulok, Kamphaeng Phet and Nakhon Sawan; NORTH-EASTERN: Phetchabun, Loei, Nong Bua Lum Phu, Udon Thani, Sakon Nakhon, Mukdahan and Khon Kaen; EASTERN: Chaiyaphum, Nakhon Ratchasima, Buri Ram, Surin, Si Sa Ket and Ubon Ratchathani; SOUTH-WESTERN: Uthai Thani and Kanchanaburi; CENTRAL: Nakhon Nayok, Krung Thep Maha Nakhon; EASTERN: Sa Kaeo, Prachin Buri, Chon Buri and Chanthaburi; PENINSULAR: Surat Thani, Trang, Satun and Songkhla.

Distribution.– Eastern and South Africa, Pakistan, Nepal, India, Sri Lanka, Bangladesh, Bhutan, Myanmar, China, Indo-China, Malaysia and Indonesia.

Ecology.– Common in evergreen, dry evergreen, hill evergreen, pine, dipterocarp, mixed deciduous and limestone forests; alt. 10 - 2,175 m; flowering and fruiting throughout the year.

Vernacular.– Kree Plaa, Khaeng Maa (Chiang Rai), Khang To, Khwi Do, Khwaeng Khaa (Northern), Kham Phok, Khui Do Cho (Karen-Kampheng Phet), Charak Paa, Tree Chawaa (Central), Tue Sue Saa Shong, Tang To (Northern), Toe See Pha Duu (Karen-Mae Hong Son), Po Saam Kian (Northern), Ping, Pra Chak Kieo, Phraai Saliang, Mak Khaeng Khaa (Prachinburi), Ram Cho Kho, Samao Yai (Nakhon Ratchasima), Saam Sum (Northern), Sang Koranee, Akkhee (Surat Thani), Akkhee Thawaan (Chiang Mai, Central), Ou, Mak Khaeng Baa, Mok Naang Ta (Chiang Mai), Mak Kaan To (Loei), Lua Saam Kian (Chiang Mai), Huu Waeng, Hang To (Loei).

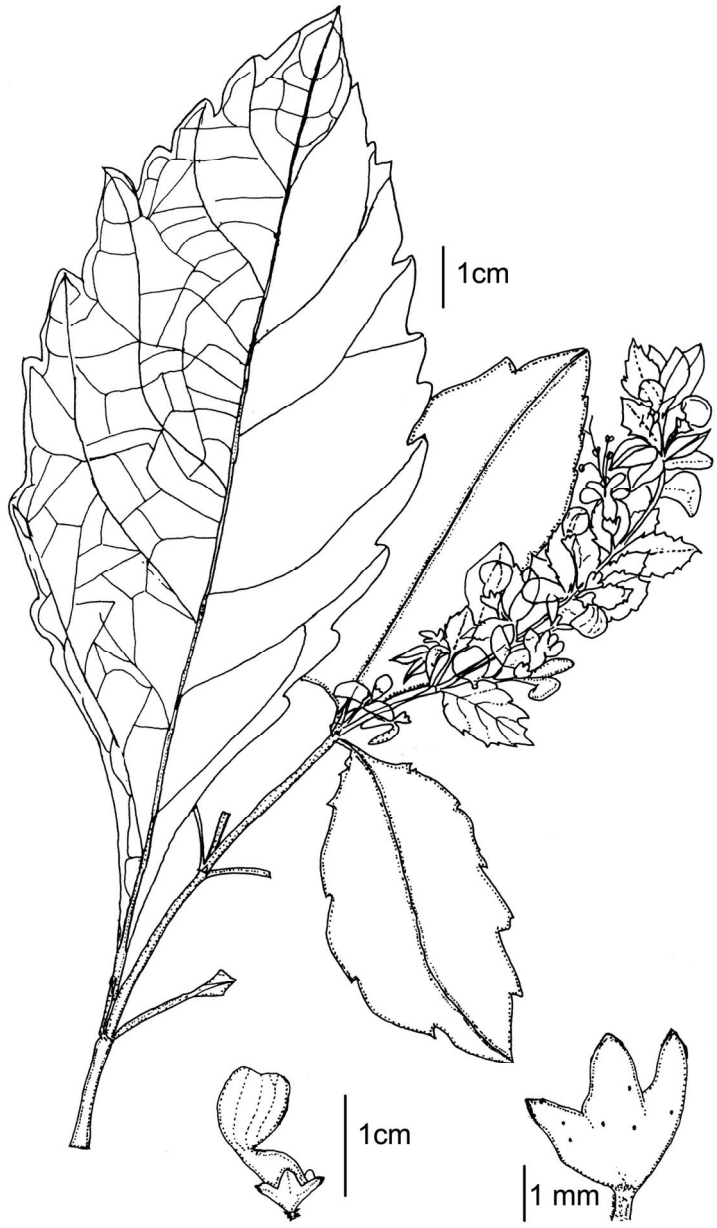

Figure 3. Drawing of *Rotheca vanprukii*: **A.** flowering branch; **B.** flowering bud; **C.** calyx.

Note.– *Rotheca serratum* is variable in leaf shape (elliptic, ovate, obovate, elliptic, oblong, oblong-ovate, lanceolate or lanceolate-elliptic), leaf phyllotaxy (ternate to opposite decussate), leaf surface (glabrous to hairy) and petiole length (0 – 4 cm). The examined types of *Cleodendrum farinosum* var. *pubescens* and *C. serratum* var. *amplexifolia*, display characters that fall within the variation of *R. serrata* and there

Figure 4. *Rotheca vanprukii*: flowering branch [lectotype: *Vanpruk* 207 (K)]. Photographed by C. Leeratiwong.

is no discontinuity. Therefore, *C. farinosum* var. *pubescens* and *C. serratum* var. *amplexifolia* are reduced to synonymy under *R. serrata*.

Rotheca vanprukii (Craib) C. Leeratiwong & C. Chantaranothai (Figures 3 and 4)

Rotheca vanprukii (Craib) C. Leeratiwong & C. Chantaranothai, **comb. nov.** Type: as *Clerodendrum vanprukii* Craib.

Clerodendrum vanprukii Craib, Bull. Misc. Inform., Kew 1911: 444. 1911; Dop in Lecomte, Fl. Indo-Chine 4(7): 883. 1935; H.R. Fletcher, Bull. Misc. Inform., Kew 1938: 428. 1938. Type: Thailand, Phrae, Hooey Kamin, alt. 240 m, May 1910, *Vanpruk* 207 (holotype K!).

Shrub 1 – 4 m tall, branches four-angled or slightly terete, lenticellate, sparsely, brownish-grey pubescent or glabrescent. *Leaves* opposite-decussate or ternate; blade membranous, oblong, oblong-lanceolate, elliptic, oblong-elliptic, obovate or oblong-ovate, 18 – 25 x 7 – 11 cm, apex acuminate or acute, base attenuate, margin usually deeply serrate; both surfaces glabrous, with subsessile glands or sometimes with pubescent hairs on midrib; secondary veins six- to eight-paired, prominent on both surfaces; tertiary veins reticulate, prominent on abaxial surface; petiole 5 – 70 mm long, swollen at base, glabrous. *Inflorescences* thyrse or axillary, 5 – 17 cm long; peduncles 0.3 – 5 cm long, four-angled, swollen, with densely, brown pubescent hairs; pedicels 3 – 5 mm long, slightly swollen, with dense, brown pubescent hairs; bracts ovate, rounded or obovate, 10 – 36 x 8 – 25 mm; bracteoles ovate, oblong, oblong-ovate or oblong-linear, 4 – 13 x 1.5 – 12 mm. *Calyx* cup-shaped, greenish-grey, 3 – 5 mm long, sparsely, whitish-brown pubescent or glabrous outside, glabrous with several subsessile glands inside; tube 2 – 3 mm long; lobes triangular-ovate, 1 – 2 x 1.5 – 2 mm, apex acute, without hairs. *Corolla* whitish-purple; tube 5 – 8 mm long, swollen, s-shaped, glabrous outside, white villose inside; lobes ovate-oblong, ovate or obovate, 7 – 10 x 3 – 6 mm, coriaceous, apex obtuse or slightly acute, glabrous outside, villose at base inside. *Stamens* white or whitish-purple, cylindrical, swollen, with villose hairs at base; short filaments 2.3 – 2.6 cm long; long filaments 2.5 – 3 cm long; anthers blackish-brown, ovate or elliptic, 1.2 – 2 mm long. *Ovary* globose, 1.5 – 2 mm long; glabrous; style whitish, slightly swollen at apex, 2.5 – 3 cm long; stigma white, short branch 0.5 – 1 mm long; long branch 1 – 2 mm. *Fruits* not seen. **Thailand.**– NORTHERN: Chiang Rai, Lampang and Phrae.

Distribution.– Endemic to Thailand.
Ecology.– Scattered in evergreen and mixed deciduous forests; alt. 100-1,000 m; flowering and fruiting July - January.

Vernacular.– Nat Kham (Phrae-Northern).

Note:- *Rotheca vanprukii* is closely similar to *R serrata*, but differs in having membranous leaves, deeply serrate margins and longer calyx lobes (1 – 2 mm long), whereas *R. serrata* has chartaceous or subcoriaceous leaves, which are shallowly serrate, dentate or entire and shorter calyx lobes (less than 1 mm long).

ACKNOWLEDGEMENTS

This work was supported by Biodiversity Research and Training Program (BRT 541075). We would like to thank the

directors, curators and staff of the following herbaria: AAU, BCU, BK, BKF, BM, CMU, K, KKU, L, P, PSU, QBG, S and Herbarium of Biology Department, Chiang Mai University, for making specimens available in this study. We also thank Dr Alan Paton for helpful suggestions on the manuscript.

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