

## *Craibiodendron* W.W. Sm. in Thailand

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**ABSTRACT.** A taxonomic revision of the genus *Craibiodendron* W.W. Sm. is presented. Two species are recognized. A key to the species, descriptions, ecological data and distributions are provided.

**KEYWORDS:** Taxonomy, Ericaceae

### INTRODUCTION

*Craibiodendron* W.W. Sm. is a small genus within the Ericaceae, containing 5 species and limited to southeastern Asia (Judd, 1986). It is classed in tribe Lyonieae Kron & Judd, subfamily Vaccinioideae Arnott (Stevens et al., 2004) and is closely related to *Lyonia* Nutt. In Thailand, Fletcher (1938) listed two species of *Craibiodendron* in the *Florae Siamensis Enumeratio* which were *C. henryi* W.W. Sm. and *C. stellatum* (Pierre) W.W. Sm. This paper deals with these species, is a part of the revision of the Ericaceae for the Flora of Thailand reveals that *C. henryi* is a rare species in Thailand having been recorded only from Doi Inthanon, while *C. stellatum* is a common species distributed in northern, northeastern, eastern and central parts of Thailand.

### MATERIALS & METHODS

This treatment for the Flora of Thailand is based on the examination of 97 specimens from AAU, BK, BKF, C, E, K, L, QBG and TCD. Abbreviations follow Holmgren & Holmgren (1990). Comparative morphology was used to delimit species in all cases.

### TAXONOMIC TREATMENT

#### CRAIBIODENDRON

W.W. Sm., *Rec. Bot. Surv. India* 4: 276. 1911; Dop in M. Lecomte, *Fl. Gén. I.-C.* 3: 728. 1930; Judd, *J. Arnold Arbor.* 67: 451. 1986; Stevens et al. in Kubitzki, *Fam. & Gen. Vascular Pl.* 6: 180. 2004. — *Nuihonia* Dop in M. Lecomte, *Fl. Gén. I.-C.* 3: 719. 1930.

Evergreen shrub or tree. *Leaves* alternate, often reddish on young shoots; blade coriaceous. *Inflorescence* axillary panicle-

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to raceme-like cymes. *Flowers* pendulous, perfect, 5-merous, usually fragrant, usually with 2 bracteoles near base to midpoint of pedicel. *Calyx* 5 imbricate lobes, articulate with pedicel, persistent in fruit. *Corolla* urceolate or cylindrical to campanulate, with usually 5 short to long, imbricate lobes, carinose, cream or white to red or grey-purple. *Stamens* usually 10, in 2 whorls, inserted at base of corolla; filament slightly flattened, geniculate, somewhat expanded near base, lacking spurlike appendage; anther more or less ovoid, lack-

ing apical awns, dehiscing by large, introrse terminal, elliptic pores. *Stigma* truncate; style columnar, slightly swollen near base, straight, slightly impressed into apex of ovary and usually slightly exerted; ovary superior, usually 5-locular. *Capsules* erect, thick-walled, robust, loculicidal, subglobose to short-ovoid or ovoid, sutures unthickened and not separating from valves at dehiscence, placentae persistent; seeds brown, ovoid with conspicuous unilateral wing, testa thin.

#### KEY TO SPECIES

1. Corolla glabrous to moderately pubescent; lobe much longer than tube. Leaves acuminate rarely acute ..... **1. *C. henryi***  
 1. Corolla moderately to densely pubescent; lobe more or less equal to tube. Leaves rounded to retuse or acute ..... **2. *C. stellatum***

**1. *Craibiodendron henryi*** W.W. Sm., Notes Roy. Bot. Gard. Edinburgh 5: 158. 1912; H.R. Fletcher, Fl. Siam. En. 2:316. 1938; Judd, J. Arnold Arboretum 67: 459. fig. 6. 1986. Type: China, Yunnan, Szemao, 6,000 ft, *A. Henry 13137* (lectotype E! selected by W.S. Judd, J. Arnold Arboretum. 67: 459. 1986; isolectotypes A, K!, NY, US!) — *C. manni* W.W. Sm., Notes Roy. Bot. Gard. Edinburgh 5: 159. 1912. Type. India, Assam (Meghalaya), Juudmaka Pahar, Jowai, near Jaintia Hills, 6,000 ft, *G. Mann s.n.* (holotype CAL, *King's Coll. (Mann) s.n.* 1891 K! possible isotype). Fig. 1A.

Tree or shrub to 15 m tall. Twigs glabrous to sparsely pubescent. Buds 1–3 per node. *Leaves* elliptic to oblong or ovate (to

slightly obovate), 6.3–15 by 1.5–4.6 cm, apex acuminate (rarely acute), base cuneate to rounded and often slightly attenuate, margin entire to slightly revolute, especially near base, midrib nearly glabrous to sparsely pubescent (throughout to restricted to only near petiole), veins 16–18-paired; petiole 5–15 mm long. *Inflorescences* panicle-like cymes 6–30 cm long, with 2 or 3 orders of branches, longest secondary branches with usually 6–30 flowers, axes glabrous to densely pubescent; pedicels 1–7 mm long, glabrous to densely pubescent; bracts ovate to narrowly triangular, 1.2–2.7 mm long, quickly caducous; bracteoles alternate to subopposite, near base to midpoint of pedicel, narrowly triangular, 0.7–1.2 mm long. *Calyx lobes* broadly ovate-triangular, 0.8–

1.5 by 1.2–2.3 mm, with acuminate, nearly acute, or rounded-mucronate apices, abaxial surface glabrous to densely pubescent. *Corolla* campanulate, 2–3.5 by 2.1–5 mm, lobes much longer than tube, white to cream, abaxial surface glabrous to moderately pubescent, often obscurely papillose at margin of lobes, middle portion of each lobe sometimes with slightly thickened ridge. *Filaments* 1.5–2 mm long; anther 0.7–0.9 mm long. *Ovary* glabrous to moderately pubescent; style glabrous. *Capsules* subglobose to short-ovoid, 6.5–12.5 by 9–16 mm, glabrous to sparsely pubescent; seeds 4–8.5 mm long.

Thailand.— NORTHERN: Chiang Mai (Doi Inthanon).

Distribution.— India (Arunachal Pradesh, Meghalaya, Nagaland), Myanmar, China (Yunnan-type).

Ecology.— In open area of upper montane forest, alt. 2,000 m. Flowering in October; fruiting in February.

Vernacular.— Ton Craib (ต้นแคริบ).

Specimens examined.— *Garrett* 477 (BKF, L, E); *Suksathan* 1593 (QBG).

**2. *Craibiodendron stellatum*** (Pierre) W.W. Sm., *Kew Bull.* 1914: 129. 1914; *Dop* in *Fl. Gén. I.-C.* 3: 729. fig. 82. 1930; H.R. Fletcher in *Fl. Siam. En.* 2: 316. 1938; Sleumer in *Dansk Bot. Ark.* 23(1): 80. 1963; Judd, *J. Arnold Arboretum* 67: 464. fig. 8. 1986. — *Schima stellata* Pierre, *Fl. Forest. Cochinchine* 1: t 122. 1887. Type: Cambodia, Samrong-tong prov., la montagne Schral, 900 m, *Pierre* 853 (holotype P!; isotype K!). — *C. shanicum* W.W. Sm., *Rec. Bot. Surv. India* 4: 277. 1911. Type:

Myanmar, Maymyo, 3,500 ft., *J.H. Luce* 4160 (lectotype CAL; isolectotypes E!, K!). Fig. 1 B & C.

Tree or shrub to 12 m tall. Twigs glabrous to moderately pubescent. Buds 1 or 2 per node. *Leaves* elliptic or oblong to ovate or obovate, 4–17 by 1.7–8 cm, apex retuse to rounded or acute, base cuneate to rounded (or slightly attenuate), margin entire to revolute, midrib sparsely pubescent, veins 10–15-paired; petiole 3–16 mm long. *Inflorescences* panicle-like cymes, 5–22 cm long with 2 or 3 orders of branches, longest secondary branches with 8–25 flowers, axes moderately to densely pubescent; pedicels 1.5–6 mm long, moderately to densely pubescent; bracts ovate to narrowly elliptic, narrowly triangular, or linear, 0.8–6.5 mm long, quickly caducous; bracteoles alternate to opposite, near base to midpoint rarely to near apex of pedicel, narrowly triangular, 0.4–1 mm long. *Calyx lobes* broadly ovate-triangular, 0.8–2.5 by 1.1–2.5 mm, with acuminate to rounded-mucronate apices, abaxial surface moderately to densely pubescent. *Corolla* campanulate, 3–4.5 by 2.5–5.5 mm, lobes more or less equal to tube, white or cream, abaxial surface moderately to densely pubescent, often obscurely papillose at margin of lobes, middle portion of each lobe usually with slightly thickened ridge. *Filaments* 1.8–2.7 mm long; anthers 0.7–0.9 mm long. *Ovary* densely pubescent; style glabrous. *Capsules* subglobose to short-ovoid, 6–13 by 10–20 mm, very sparsely to sparsely pubescent; seeds 5–10 mm long.

Thailand.— NORTHERN: Mae Hong Son, Chiang Mai (Doi Chiang Dao, Fang, Doi Inthanon, Mae Kok Luang, Mae Rim, Doi Mae Ya, Bo Luang, Doi Saket, Doi Suthep), Chiang Rai (Doi Luang), Nan (Wang Sa), Lumphun, (Doi Khun Tan, Mae Li), Lampang, Phrae, Tak; NORTHEASTERN: Phetchabun, Loei (Phu Kradung, Phu Ruea); EASTERN: Chaiyaphum (Phu Khieo); CENTRAL: Suphan Buri (Phu Toey).

Distribution.— China, Myanmar, Laos, Cambodia, and Vietnam.

Ecology.— Dry dipterocarp forest, lower montane forest and open area; 900–1600 m alt. Flowering June–September; fruiting December–March.

Vernacular.— Dao rai (ดาราไร) (Chiang Mai), mueat phu (เหมี้อตู่) (Loei).

Specimens examined.- *Abbe et al.* 9370 (BKF, E), 9434 (BKF); *Beusekom et al.* 4361 (BKF, C, L), 4819 (BKF); *Bult* 464 (BKF); *Chamchumroon* 1790 (BKF), 1905 (BKF); *Chayamarit et al.* 2981 (BKF); *Dee* 362 (BKF), 602 (BKF); *Din* 145 (BKF), 153 (BKF); *Fukuoka & Ito* T-35213 (BKF); *Fukuoka* T-62483 (BKF); *Glamwaewwong* 1356 (QBG); *Hansen et al.* s.n. 25.1.64 Mae Jam (C); *Hansen & Smitinand* 12630 (AAU, BKF, K); *Iwasuki et al.* T-9417 (BKF); *Jackson* 6138 (BKF); *Kantchai* 271 (BKF), 663 (BKF); *Kerr* 1282 (AAU, L, E); *Kopachon* 13 (L); *Koyama et al.* T-32155 (BKF), T-32580 (BKF), T-32759 (BKF), T-39858 (AAU, BKF), T-49966 (BKF); *Koyama & Phengklai* T-39037 (AAU); *Larsen et al.* 1952 (BKF, L, AAU), 2147 (BKF, AAU), 2769 (BKF, L, AAU), 34159 (BKF); *Larsen & Hansen* 4805 (BKF); *Maknoi* 654 (QBG); *Maxwell* 02-241 (BKF,

CMU), 87-957 (BKF, CMU, L), 88-52 (CMU, L), 89-181 (BKF, CMU, L), 91-83 (CMU), 93-957 (BKF, CMU), 95-611 (BKF, CMU), 96-25 (BKF, CMU), 96-1085 (BKF, CMU), 96-1201 (BKF, CMU), 97-987 (BKF, CMU); *Mitsuta* T-46469 (BKF); *Morakot* 002 (QBG); *Murata et al.* T-41841 (BKF), T-51585 (BKF); *Nanakorn et al.* 344 (QBG), 1242 (QBG), 4104 (QBG), 5682 (QBG), 6244 (QBG), 6780 (QBG), 6909 (QBG), 8188 (QBG), 9546 (QBG), 10198 (QBG) *Nilphanit* 37 (BKF); *Nimanong & Phusomsaeng* 1791 (BKF); *Niyomdham* 906 (BKF); *Nooteboom* 692 (BKF); *Pongamornkul* 358 (QBG); *Pooma* 57 (BKF); *Put* 378 (AAU), 3974 (E), 4532 (E); *Serm* 97 (QBG); *Simpson & Parnell* 1765 (BKF, K, TCD); *Smitinand* 90-216 (BKF), 10127 (BKF), 3756 (BKF); *Smitinand & Seidenfaden* 5540 (BKF), 10630 (BKF, L); *Sørensen et al.* 2649 (C), 2656 (C), 4805 (BKF, C), 5375 (C, E), 5403 (C); *Srisanga* 2615 (QBG); *Suddee, Paton & Puddjaa* 1074 (BKF, K, TCD); *Suksathan* 2829 (QBG); *Takahashi* T-62549 (BKF); *Tangsuput* 31 (BKF); *Watthana* 2431 (QBG); *Watthana & Suksathan* 831 (QBG); *Watthana et al.* 640 (QBG); *Winit* 1564 (BKF), 1811 (BKF); *Wongnak s.n.* (QBG); *Wongprasert* 016-17 (BKF), s.n. (BKF 132802); *Yahava* T-50155 (BKF).

## REFERENCES

- Fletcher, H.R. 1938. Ericaceae. In: **Florae siamensis enumeratio**. W.G. Craib (Ed), vol. 2, p. 316. Siam Society, Bangkok.  
Holmgren, P.K. & Holmgren, N.H. 1990.

- Index Herbariorum.** Part 1 : the Herbaria of the World. 8<sup>th</sup> Edition. NYBG Press, New York.
- Judd, W.S. 1986. A Taxonomic Revision of *Craibiodendron* (Ericaceae). **Journal of the Arnold Arboretum** 67: 441–469.
- Stevens, P.F, Luteyn, J., Oliver, E.G.H., Bell, T.L., Brown, E.A., Crowden, R.K., George, A.S., Jordan, G.J., Ladd, P., Lemson, K., McLean, C.B., Menadue, Y., Pate, J.S., Stace, H.M. & Weiller, C.M. 2004. Ericaceae. In: **The families and genera of vascular plants**. K. Kubitzki (Ed), vol. 6, p. 180. Springer, Heidelberg.



**Figure 1.** *Craibiodendron henryi* W.W. Sm. A. branch and fruits, *C. stellatum* (Pierre) W.W. Sm. B. flowers; C. branch and flowers.