

New records of *Curcuma* L. (Zingiberaceae) in Thailand

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ABSTRACT. *Curcuma flaviflora* S.Q. Tong and *C. rubrobracteata* Skornickova, M. Sabu & M. Prasanthkumar are newly recorded from northern and western Thailand respectively.

INTRODUCTION

K. Larsen published a preliminary checklist of Zingiberaceae in Thailand in 1996. Since then, a few species of *Curcuma* have been described from neighbouring countries (Mood & Larsen, 2001; Sirirugsa & Newman, 2000 and Skornickova et al., 2003). While revising this genus for the Flora of Thailand, the authors found *C. flaviflora* S.Q. Tong and *C. rubrobracteata* Skornickova, M. Sabu & M. Prasanthkumar, as new records for Thailand.

1. *Curcuma flaviflora* S.Q. Tong, Acta Bot. Yunnanica, 8(1): 37. 1986; Wu & Larsen, Fl. China 24: 363. 2000. Figs. 1A-B.

Leafy shoot 30–50 cm tall. *Bladeless* sheaths 4–5, pubescent, apex mucronate, 3–23 cm long. *Leaf sheaths* pubescent, 20–30 cm long; ligules bilobed, glabrous, lobes rounded to obtuse, ciliate, 2–4 mm long; petiole pubescent, 2–5 cm long; blades oblanceolate, green, sometimes with a red patch on either side of midrib, upper surface glabrous, lower surface pubescent, base cuneate, apex acuminate, 18–30 by 6–8.5 cm. *Inflorescence* lateral, appearing before the leafy shoot. *Scape* pubescent, 5–15 cm long; scapose scale linear-lanceolate, pubescent, 10 cm long; spike 3–5 cm long. *Bracts* 3–4.5 by 1.3–1.5 cm, lanceolate, acuminate, pubescent on both surfaces, connate part 1.5 cm, free part 3.0 cm. *Bracteoles* absent. *Calyx* tubular, hairy along ridges, apex 3-lobed, 21 mm long, split down one side 7 mm. *Corolla* tube pubescent, 3.8–4.2 cm long; corolla lobes 15–17 by 5–7 mm, scattered hairy; dorsal one concave, hooded, apex acute-cucullate; lateral ones shallowly concave, hooded, apex rounded. *Staminodes* ovate, glandular hairy on inner surface, apex obtuse, 20 by 12 mm. *Labellum* obovate, yellow with bright yellow mid-band, rarely with red streaks at sinus, glandular hairy more, densely on either side of mid-band, apex deeply bifid, 20 by 15 mm, cleft 7 mm deep. *Stamen* pubescent; filament shallowly concave, 5 by 4 mm; crest emarginate, 1 mm long; spurs acute conical, pointed forwards, diverging at apex, glabrous, 5 mm long. *Ovary* barrel-shaped, pubescent, 5 mm long; stylodes slender, apex acute, 7 mm long; stigma with lateral opening, ciliate, 1.5 mm across.

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Thailand.— NORTHERN: Chiang Mai, Mae Hong Son.

Ecology.— Found in open areas in pine forests, 1,200 m above sea level or higher. Flowers in May–July.

Distribution.— South China (Yunnan).

Notes.— This species is found only at high altitude from 1,200 m and up. The unique character is the pure yellow flower. The original description mentions red streaks on labellum but this is rarely found in Thai plants. Similar species found in northern Thailand are *C. bicolor* J. Mood & K. Larsen, *C. ecomata* Craib, *C. glans* K. Larsen & J. Mood and *C. singularis* Gagnep. which have large, blunt and forward pointed anther spurs. These species also share many common characters such as rounded to cordate leaf-base, terminal inflorescence, without coma bracts and staminodes free from dorsal corolla-lobe.

Specimens examined.— NORTHERN: Chiang Mai [Doi Angkang, Fang, 21 July 2003, *Maknoi* 356 (AAU, PSU, QBG); same locality, 15 May 2004, *Maknoi* 535 (AAU, PSU, QBG); Chiang Dao, *Norsaengsri* 1476 (QBG); Doi Angkang, Fang, 12 June 1999, *Srisanga* 721 (QBG); Khun Huai Mae Kok, Chiang Dao, 5 June 2001, *Wongprasert* 015-05 (BKF)]; Mae Hong Son [15 km N.W. of Mae Hong Son, 18 June 1973, *Geesink*, *Panichapol* & *Santisuk* 5960 (C, E); Doi Pui, Huai Hi, Mueang, 25 July 2003 *Maknoi* 382 (AAU, PSU, QBG)].

2. *Curcuma rubrobracteata* Skornickova, M. Sabu & M. Prananthkumar, Gard. Bull. Singapore. 55(1): (2003) 89. Figs. 1C–D.

Plant 80–100 cm tall. Bladeless sheaths 2, 12–27 cm long, glabrous. *Leaf sheaths* 20–30 cm long, glabrous or densely hairy; ligule bilobed, 2 mm long, sparsely hairy, with rounded apex; petiole 6–14 cm long, glabrous; blade ovate, 25–40 by 11–17 cm, upper surface with hairs along secondary nerves, lower surface glabrous, base broadly cuneate, apex acuminate. Inflorescence terminal; scape 3–12 cm long, densely hairy; spike 7–10 cm long. *Bracts* 4.5–5 by 2–3 cm, hairy on both surfaces, apex rounded to obtuse; coma bracts absent. *Bracteoles* broadly ovate, 32 by 27 mm, hairy, apex obtuse. *Calyx* tubular, 8–10 mm long, hairy, apex indistinct, 3-lobed, not split down one side. *Corolla* tube 30–35 mm long, sparsely hairy outside, with a hairy ring inside; corolla lobes 15–16 by 7–15 mm, glabrous; dorsal one hooded with acuminate-cucullate apex, lateral ones concave, apex rounded. *Staminodes* broadly obovate, 15–17 by 11–12 mm, glandular hairy, apex obtuse; labellum 3-lobed, 20 by 17–20 mm, glandular hairy near base, apex retuse. Stamen glandular hairy; filament flat, 4 by 4–5 mm; anther 5 by 2 mm; spurs flat, triangular, 2.5–3 mm long, apex acuminate, s-shaped; crest ca. 1 mm long, apex rounded. *Ovary* barrel-shaped, 2–3 mm long, hairy; stylodes clavate or cylindrical, 4 mm long, apex obtuse; stigma 1.5 mm wide, ciliate, laterally opened.

Thailand.— NORTHERN: Chiang Mai, Lampang, Mae Hong Son, Phitsanulok, Tak; SOUTHWESTERN: Kanchanaburi.

Ecology.— Found in deciduous and evergreen forests, from 220–700 m above sea level. Flowers in May–August.

Distribution.— India and Myanmar.

Notes.— This species has been collected many times since 1922. The distinguishing characters are the orange red bracts with light yellow or white base and compact terminal inflorescence which appears laterally. This species belongs to subgenus *Curcuma* (*Eucurcuma* K. Schum.).

Specimens examined.— NORTHERN: Chiang Mai [Doi Chiang Dao, Me Na Liao, 12 July 1950, *Garrett* 1334 (K); Mae Rim, 15 km N. of Chiang Mai, 17 July 1968, *Larsen et al.* 2586 (AAU, BKF); along the road Fang-Chiang Mai, 27 July 1968, *Larsen et al.* 2766 (AAU, BKF); Mae Sa Noi WF, QBG, 18 July 2003, *Maknoi* 337 (AAU, BKF, PSU, QBG); Mae Mao reservoir, Fang, 22 July 2003, *Maknoi* 358 (AAU, BKF, PSU, QBG); Doi Nawong Hoy, Maerim Samoeng road, 10 Aug. 1989, *Maxwell* 89-1019 (CMU, E); Doi Chiang Dao, S.E. foot hill, 25 June 1989, *Maxwell* 89-807 (CMU); Mawk Fa Falls, along Mae How stream, 18 August 1990, *Maxwell* 90-890 (CMU); Ban Wieng Pa, *Sidongyen* subdistrict, Fang, 8 July 1991, *Maxwell* 91-619 (AAU, CMU, E, P); N part of Wahng Hahng Falls, Doi Suthep-Pui, 10 September 1992, *Palee* 74 (CMU)]; Lampang [Doi Khun Than NP, Hang Chat, 29 July 1994, *Maxwell* 94-821 (CMU); Jae Son NP, near HQ, Mueang Pan, 24 Aug. 1995, *Maxwell* 95-576 (BKF, CMU); Jae Son NP, Pha Ngaem (Nahn Kaht) cave, 25 Aug. 1995, *Maxwell* 96-1137 (BKF, CMU); Jae Son NP, Wang Nuea, 2 June 1996, *Maxwell* 96-781 (CMU); Jae Son NP, Wang Nua, 27 June 1996, *Maxwell* 96-918 (CMU); Jae Son NP, Mueang Bahn (Pan), 24 May 1996, *Panatkool* 53 (CMU); Muang Ngao, 15 July 1931, *Put* 3998 (C, K, L)]; Mae Hong Son [19–24 km E. of Mae Sariang, 17 July 1998, *Kress* 98-6213 (AAU); Ban Pang Pake, Pai, 24 July 2003, *Maknoi* 377 (AAU, BKF, PSU, QBG)]; Phitsanulok [Thung Salaeng Luang NP, 25 July 1966, *Larsen et al.* 878 (AAU, BKF, P)]; Tak [Thung Yai (Burmese side), 17 June 1922, *Kerr* 6145 (BK, BM, C, K); Me Mue, Muan, 20 June 1922, *Kerr* 6145A (BK, BM, K); Mu Kee Haw (Karen) village, Pawo, Mae Sot, 18 Aug. 1994, *Maxwell* 94-893 (BKF, CMU); Khao Phawo, ca. 70 km W. of Tak, 23 July 1973, *Murata et al.* T16871 (AAU, BKF); Mae Sot, 14 July 1999, *Ngamriabsakul* 45 (BKF, E); Chedi Ko, Mae Sot, 11 July 1972, *Smitinand & Seidenfaden* 11621 (AAU, BKF, L)]; SOUTHWESTERN: Kanchanaburi [Between Huai Ban Kao and Kriti, 2 July 1973, *Geesink et al.* 6071 (C); Ka Tha Lai, 25 km E. of Wangka, 4 June 1946, *Kostermans* 798 (BKF, K, P); Thung Kang Yang, 2 July 1963, *Larsen et al.* 10431 (AAU); Thung Kang Yang, 2 July 1963, *Larsen et al.* 10441 (AAU); Thung Kang Yang, 6 July 1963, *Larsen et al.* 10538 (AAU); W. of Sisawat, 26 June 1974, *Larsen et al.* 33800 (AAU, K, QBG); Tong Pha Phum to Sangkhla Buri, 11 Aug. 2003, *Maknoi* 453 (AAU, BKF, PSU, QBG); Thung Pha Phum, 6 July 1973, *Maxwell* 73-174 (AAU, BK); Huai Ban Kao, Kanchanaburi, 13 July 1973, *Maxwell* 73-293 (AAU, BK); Thung Yai Naresuan WS, Sangklaburi, 17 June 1993, *Maxwell* 93-645 (CMU); Klu Nam Ron, 27 June 1934, *Put* 32 (K); Hin Dat, 29 June 1926, *Put* 39 (K)].

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ACKNOWLEDGEMENTS

This study is supported by Royal Golden Jubilee Scholarship (4BPS45E1) and DANIDA (CBBP-QBG).



Figure 1. A.–B. *Curcuma flaviflora* S.Q. Tong; C.–D. *C. rubrobracteata* Skornick., M.Sabu & Prasanthk.