



## Notes on the Orchid Flora of Thailand (I)

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**ABSTRACT:** Ongoing studies in connection with the preparation of the orchid account for Flora of Thailand, have led to a variety of new taxonomic and floristic findings that are reported in this paper. One new species, *Hetaeria armata*, is described, the first known find of a natural hybrid in the genus *Sirindhornia* is reported, and the new combination *Odontochilus uniflorus* is proposed. *Odontochilus macranthus*, *Cheirostylis moniliformis*, and *Dendrobium lankaviense* are newly recorded for the flora of Thailand, and evidence is provided that confirms the previously proposed occurrence of *Zeuxine violascens* and *Cymbidium tigrinum* in this country.

**KEY WORDS:** *Cheirostylis moniliformis*, *Cymbidium tigrinum*, *Dendrobium lankaviense*, *Hetaeria armata*, *Odontochilus uniflorus*, *Odontochilus macranthus*, Orchidaceae, *Sirindhornia mirabilis* × *monophylla*, *Zeuxine violascens*.

## INTRODUCTION

The international Flora of Thailand project was commenced in 1967 on the initiative of Thai and Danish botanists; the first notion of the project had arisen during the Thai-Danish botanical expedition in 1958–1959 under the leadership of Professor Kai Larsen, University of Aarhus. With the publication of issue 9(4) (Santisuk and Larsen, 2008), more than 4,000 of Thailand's approximately 11,000 species of vascular plants have been treated in Flora of Thailand. Several of the families that have not yet been included are among the most species-rich of the country; this is particularly true for the Orchidaceae with an estimated 1,135 species in Thailand (Thaithong, 1999).

In 2002 the editors of the project invited H. Æ. Pedersen to coordinate the treatment of the Orchidaceae for Flora of Thailand. The orchid account is planned to appear as one volume published as six instalments; the first instalment (containing subfamilies Cyrtipedioideae, Vanilloideae and Orchidoideae) is currently being edited. At present, the group of authors include 13 people from five countries, but these numbers are expected to increase over the coming years.

Two earlier revisions of the Thai orchid flora exist: The Orchids of Thailand (Seidenfaden and Smitinand, 1958–1964) and Orchid Genera in Thailand I–XIV (Seidenfaden, 1975–1988). It might therefore be suggested that the contribution for Flora of Thailand could simply be prepared by condensation of Seidenfaden's voluminous revisions. However, there are at least four good reasons to let the flora contribution take the shape of a new thorough revision. First, Seidenfaden's treatments hardly included any

descriptions, and obviously descriptions for the flora should be prepared directly from material collected in Thailand. Second, a number of monographs and major revisions have appeared during recent years, the results of which are not always in line with Seidenfaden's findings (e.g. Pedersen, 1993; Christenson, 2001; Vermeulen, 2002; Watthana, 2006). Third, Seidenfaden's work was focused at species-level taxonomy; preparation of the orchid account for Flora of Thailand synchronously with the ongoing Genera Orchidacearum project (Pridgeon et al., 1999–2005ff) represents an ideal opportunity for taxonomic improvements at the generic level. Fourth, new species and new national records of orchids are still regularly being reported from Thailand, and it is important to have these novelties thoroughly incorporated in the flora, so that they can be identified and given the necessary attention in a conservation context. In this paper we propose two new taxa and a new combination for the flora account. Furthermore, we present three new national records and provide evidence that confirms the previously proposed occurrence of *Zeuxine violascens* Ridl. and *Cymbidium tigrinum* Parish ex Hook. in Thailand.

## NEW SPECIES

***Hetaeria armata*** Ormerod & H. A. Pedersen, *sp. nov.*

Fig. 1

Type: Thailand, peninsular floristic region, Nakhon Si Thammarat, Khao Khai Chang, 11 April 1953; *Suvarnakoset* 538 (holotype: BKF!, isotype: C!).

*Species haec H. youngsayeo affinis, sed petalis angustioribus binerviis, una multiarmata appendice interna tantum in quoque latere labelli et pilis eglandulosis plerumque multicellularibus ovarii distinguitur.*

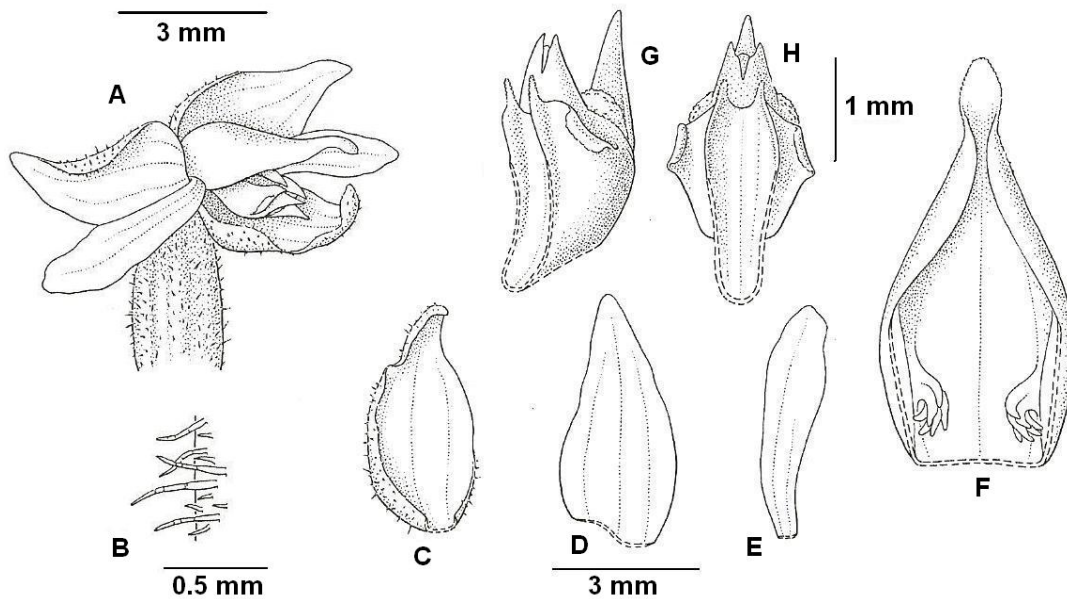


Fig. 1. *Hetaeria armata*. A: Flower. B: Detail of non-glandular hairs on ovary. C: Dorsal sepal. D: Lateral sepal. E: Petal. F: Labellum. G: Column in slanting lateral view. H: Column in front view. A-H: *Suvarnakoset 538*. Drawing by Katja Anker.

*H. nitida* auct., non Ridl.: Seidenf., Dansk Bot. Ark. 32(2): 103 p.p., Fig. 64b–f. 1978.

Terrestrial, rhizomatous herbs; the creeping stem-like rhizome rooting from its nodes. *Flowering shoots* terminal, erect from a decumbent base, c. 37.5 cm tall; stem diameter c. 3 mm at base, c. 1 mm just below the rachis. *Foliage leaves* c. 4, somewhat crowded on the lower part of the stem, petiolate; petiole channelled, sheathing at base, (1.5–)2.2–3 cm long (including sheath); lamina obliquely elliptic to oblong-lanceolate, acute to acuminate, (3–)7–8.5 × (1–)2.3–4.2 cm. *Inflorescence* spicate, pubescent, fairly dense; peduncle provided with c. 7, 1.1–2 cm long bract-like leaves; rachis c. 10 cm long, many-flowered; floral bracts suberect, linear-lanceolate, acute to acuminate, 1-veined, pubescent on the dorsal surface, 7.4–11.5 × 2.3–3 mm. *Flowers* (sub)sessile, non-resupinate, white; perianth more or less perpendicular to the ovary. *Sepals* free, 3-veined, pubescent on the dorsal surface; dorsal sepal porrect over the column, boat-shaped, ovate-oblong, obtuse, 4.2–5.3 × 1.8–2 mm; lateral sepals slightly spreading, shallowly boat-shaped, obliquely ovate-oblong, obtuse to subacuminate, 4.7–5.3 × 2.2–2.3 mm. *Petals* connivent with the dorsal sepal, obliquely linear-oblong, (sub)acute, 2-veined, glabrous, 3.5–4.9 × 1.1–1.3 mm. *Labellum* adnate to the proximal half of the column, straight (i.e., not twisted), 3.7–4.3 mm long along the midline, obscurely differentiated in hypochile and epichile; basal part slightly saccate, c. 2.1 mm wide, inside with 1 fleshy, distally multiarmate appendage in either side; epichile vestigial, ovate to

oblongate, distinctly less than half as wide as the hypochile. *Column* straight (i.e., not twisted), irregularly subterete, 2.2–2.3 mm long, provided with two small wings on the front; devoid of stylids; wings on the front incurved, obliquely triangular, shorter than the rostellum; rostellum triangular, bifid, c. 0.5 mm long, subequal to the anther, producing a tiny tegula; viscidium 1, naked; anther versatile, acuminate in front, 2–2.1 mm long; pollinia 2, basitonous. *Ovary* pubescent of non-glandular hairs, 4.5–9.5 mm long. *Fruit* not seen.

Material of *H. youngsayei* Ormerod studied for comparison: CHINA: Hong Kong: Mt. Gough (*Walden/cult. Barretto/S. Y. Hu 13233 K* [holotype]). THAILAND: northeastern floristic region: Nakhon Phanom, Phu Lang Ka, 19 January 2003 (*Suddee et al. 1752 BKF*). Eastern floristic region: Nakhon Ratchasima, Pakthoungchai, 28 January 1968 (*Phengnaren 248 BKF*). Southeastern floristic region: Chanthaburi, Khao Sabab, 18 January 1958 (*Sørensen et al. DB-477 BKF C*), flowering in cultivation 24 February 1960 and January 1962 (*Sørensen 16 C*). Southwestern floristic region: Uthai Thani, "Ban Rai, Huai Ka Kaeng Game Reserve", 20 February 1970 (*van Beusekom & Santisuk 2861 BKF*).

Notes: Seidenfaden's (1978) treatment of *Hetaeria nitida* Ridl. contained a mixture of at least four species. Ormerod (2004) found that *H. nitida* s.s. was conspecific with *H. oblongifolia* Blume. He further described one of the plants covered by Seidenfaden's treatment as a new species, *H. youngsayei* Ormerod, based on material from Hongkong. *Hetaeria armata*, described here, represents a third species. Finally, Ormerod (2004) suggested that Schmidt 816 (C) from Chanthaburi in SE Thailand might represent another undescribed species (together with a Griffith specimen from Myanmar that was not cited by

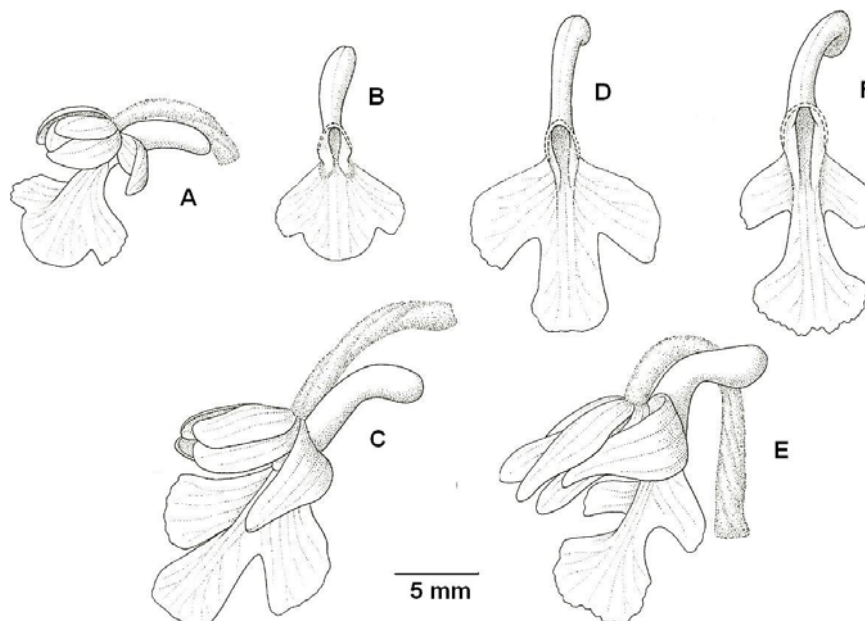


Fig. 2. Flower (below) and labellum (above) of *Sirindhornia monophylla* (A, B), *S. mirabilis* × *monophylla* (C, D) and *S. mirabilis* (E, F). A-B: Suksathan 2990. C-D: Suk-ieam s.n./QBG 24658. E-F: Suksathan 3000. Drawing by Katja Anker.

Seidenfaden). However, re-examination of the poorly preserved Schmidt 816 has revealed that this specimen belongs to *H. finlaysonianana* Seidenf. The specimen collected by Griffith in Myanmar in 1837 (now at K) may still represent an undescribed species, but only large buds are left on the plant, rendering final identification impossible.

*Hetaeria armata* is reminiscent of *H. youngsayei*, but is distinguished by its two-veined, obliquely linear-oblong petals that are only 1.1–1.3 mm wide (*H. youngsayei* has three-veined, obliquely obovate to elliptic petals that are 2.4–3.3 mm wide). Additionally, only one multiarmate appendage is found in either side in the basal part of the labellum in *H. armata* (whereas *H. youngsayei* holds 3–5 multiarmate appendages in either side), and the ovary in *H. armata* is pubescent of one- to four-celled non-glandular hairs (whereas *H. youngsayei* has one-celled glandular hairs).

The type was collected in evergreen forest. The specific epithet is derived from the Latin *armatus*, equipped, armed, referring to the armed or spiky internal appendages of the labellum.

#### NEW HYBRID

*Sirindhornia mirabilis* H. A. Pedersen & Suksathan × *monophylla* (Collett & Hemsl.) H. A. Pedersen & Suksathan. Fig. 2

Thai material examined: Northern floristic region, Tak, Khao Hua Mot, 3 June 2004 (*Suk-ieam s.n./QBG 24658* QBG).

Notes: The genus *Sirindhornia* H. A. Pedersen & Suksathan that was not described until 2003 (Pedersen et

al., 2003) contains three species. *Sirindhornia monophylla* is known from Yunnan, northeastern Myanmar (Shan State) and the province of Tak in northern Thailand, whereas *S. mirabilis* and *S. pulchella* H. A. Pedersen & Indhamusika appear endemic to the mountains Khao Hua Mot and Doi Chiang Dao, respectively, in northern Thailand. The geographic ranges of *Sirindhornia* species are only known to overlap on Khao Hua Mot (province of Tak, northern Thailand) where *S. mirabilis* and *S. monophylla* grow in sympatry. In spite of sustained efforts in the field (Santi Watthana and Kanokorn Srimuang, pers. comm.) pollination of *Sirindhornia* has not yet been observed.

On 3 June 2004, staff from Queen Sirikit Botanic Garden in Chiang Mai found an aberrant *Sirindhornia* individual on Khao Hua Mot. Colour photos of the plant were sent to the first author who also got the opportunity to examine a spirit-preserved flower during a subsequent visit to Queen Sirikit Botanic Garden. The aberrant individual was clearly intermediate between *S. mirabilis* and *S. monophylla* – particularly with regard to: (1) labellum shape, (2) spur morphology, (3) the relative distance that the walls of the spur entrance extend onto the labellum lamina and (4) orientation of the sepals (Fig. 2). In our opinion, there is hardly any doubt that we are dealing with the first recorded find of a natural *Sirindhornia* hybrid, *S. mirabilis* × *monophylla*.

#### NEW COMBINATION

*Odontochilus uniflorus* (Blume) H. A. Pedersen & Ormerod, *comb.nov.*



*Cystopus uniflorus* Blume, Fl. Javae nov. ser.: 69, Pls 21(Fig. 1), 23G. 1858 (1859?); Coll. Orchid.: 83, Pls 21(Fig. 1), 23G. 1859; *Anoectochilus uniflorus* (Blume) Miq., Fl. Ned. Ind. 3: 733. 1859; *Pristiglottis uniflora* (Blume) Cretz. & J.J.Sm., Acta Fauna Fl. Univ. Seria II: Botanica I(14): 6. 1934. *Odontochilus calcaratus* Hook.f., Fl. Brit. India VI: 99. 1890; *Anoectochilus calcaratus* (Hook.f.) Ridl., Mat. fl. Malay. Penins. I: 214. 1907.

Notes: For many years, *Odontochilus* Blume was most often included in *Anoectochilus* Blume, but in Genera Orchidacearum (Ormerod et al., 2003), it has been re-instated as a distinct genus – due to consistent differences in the morphology of spur and stigma. In the same publication, *Pristiglottis* Cretz. & J.J.Sm. has been reduced to a synonym of *Odontochilus* – due to the existence of taxa that cannot be readily assigned to either concept and appear to have an intermediate status. For the species that Seidenfaden (1978) treated as *Anoectochilus calcaratus* (Hook.f.) Ridl. the name *Odontochilus calcaratus* Hook.f. of 1890 (Hooker, 1890–1894: 99) is then available. However, as substantiated by Schuiteman (1996), *O. calcaratus* should be considered a synonym of *Pristiglottis uniflora* (Blume) Cretz. & J. J. Sm., based on *Cystopus uniflorus* Blume of 1858 (1859?). Consequently, a new combination is called for under *Odontochilus*.

## NEW RECORDS AND OTHER NOTEWORTHY FINDS

***Odontochilus macranthus*** Hook.f., Fl. Brit. India VI: 98. 1890

*Anoectochilus macranthus* (Hook.f.) Ridl., Mat. Fl. Malay. Penins. I: 215. 1907; *Cystopus macranthus* (Hook.f.) Kuntze, Revis. Gen. Pl. II: 658. 1891 (non Holtum, Gard. Bull. Singapore XI: 278. 1947, comb. superfl.); *Pristiglottis macrantha* (Hook.f.) J. J. Wood & Seidenf., Orch. Penins. Malaysia Singapore: 82, Fig. 31. 1992.

Thai material examined: Peninsular floristic region: Yala: Hala-Bala Wildlife Sanctuary in Betong district, 23 May 2005 (Middleton et al. 3603 BKF).

Notes: Until now, *O. macranthus* has been considered endemic to Peninsular Malaysia, where it occurs north to Perak (Seidenfaden and Wood, 1992). Thus, the new collection from southernmost Thailand only represents a modest extension of the known range. The Thai specimen was collected in wet evergreen forest at 1200 m alt.

***Cheirostylis moniliformis*** (Griff.) Seidenf., Dansk Bot. Ark. 32(2): 69, Fig. 40. 1978

*Goodyera moniliformis* Griff., Itin. pl. Khayah mts.: 143. 1848; *Zeuxine moniliformis* (Griff.) Griff., Not. pl. asiat. III: 397. 1851; Ic. pl. asiat. III: Pl. CCCL. 1851. *Cheirostylis bhotanensis* Tang & F. T. Wang, Acta Phytotax. Sin. 1: 86. 1951.

Thai material examined: Southwestern floristic region: Prachuap Khiri Khan: Kaeng Krachan, 20 January 2004 (Middleton et al. 2299 BKF); Ratchaburi, Bangtapan, 25 December 1927 (Put 1382 K).

Additional material examined: BHUTAN: Sine loco et anno (Griffith 679 K [holotype]). INDIA: Assam, Denning Outpost, Lohit Valley, 2 March 1928 (Kingdon-Ward 7902 AMES, K).

Notes: Compared to material from Bhutan and Assam, the previously known range of this species (see descriptions in Balakrishnan, 1978; Shukla and Deori, 1986; Pearce and Cribb, 2002), the specimens constituting the only two collections of this species from Thailand are generally taller and have more flowers; additionally, their petals are falcately oblanceolate rather than obliquely subspathulate. Further studies may lead to recognition of two distinct taxa. It was Ruengwit Namdang who originally annotated Middleton et al. 2299 (BKF) as *Cheirostylis moniliformis*, whereas Put 1382 (K) has not previously been referred to this species. Middleton et al. 2299 was collected in secondary forest on a ridge (c. 600 m alt.); the label of Put 1382 includes no habitat information.

***Zeuxine violascens*** Ridl., Mat. Fl. Malay. Penins. I: 218. 1907

*Hetaeria purpurascens* Blume, Fl. Javae nov. ser.: 88, Pls 9(fig. 3), 37B. 1858 (1859?); Coll. Orch.: 105, Pls 9(fig. 3), 37B. 1859.

Thai material examined: Peninsular floristic region: Nakhon Si Thammarat, Khao Luang, 2 July 1966 (Seidenfaden & Smitinand GT 6355 C); W of Khiriwong, 7 July 1966 (Seidenfaden & Smitinand GT 6266 C).

Note: This species was originally described from Java, and it has subsequently been recognized from Peninsular Malaysia, Borneo (Sarawak) and Sumatra (e.g. Seidenfaden and Wood, 1992; Beaman et al., 2001; Comber, 2001). Recently, it was reported from the province of Nakhon Si Thammarat in Peninsular Thailand (Sitthisajjadharn, 2007), accompanied by a convincing colour photo, but without precise locality. I have later been informed (S. Sitthisajjadharn, in litt. via Kanokorn Srimuang) that the photo was taken by P. Tripeth in Khao Luang National Park on 4 November 2007. The occurrence of *Z. violascens* on Khao Luang is confirmed by a specimen collected by Seidenfaden & Smitinand in 1966, and the same collectors also found the same species west of Khiriwong (see above). Both collections were originally identified as *Z. nervosa* (Wall. ex Lindl.) Benth. ex Clarke, and details from both specimens are even included in Seidenfaden's illustration of the latter species (Seidenfaden, 1978: Fig. 49d, f, g). However, the labellum morphology of the flowers and their free petals that are not abruptly narrowed below the apex clearly place the material in *Z. violascens*. *Seidenfaden & Smitinand GT 6266* and *6355* were collected at 300–500 and 750 m alt., respectively, but no further habitat information is indicated on the labels.

***Dendrobium lankaviense*** Ridl., J. Straits Branch Roy. Asiat. Soc. 54: 49. 1909



*Dendrobium tenuicaule* Ridl., J. Straits Branch Roy. Asiat. Soc. 39: 73. 1903, *nom. illeg.* (non Hook.f. 1890); *Pedilonum lankaviense* (Ridl.) Rauschert, Repert. Spec. Nov. Regni Veg. 94: 460. 1983; *Eurycaulis lankaviensis* (Ridl.) M. A. Clem., Telopea 10(1): 287. 2003.

*Dendrobium exilicaule* Ridl., Fl. Malay Penins. 4: 50. 1924, *syn. nov.*; *Pedilonum exilicaule* (Ridl.) Rauschert, Repert. Spec. Nov. Regni Veg. 94: 459. 1983; *Eurycaulis exilicaulis* (Ridl.) M. A. Clem., Telopea 10(1): 286. 2003.

*Dendrobium hasseltii* auct., non (Blume) Lindl.: Kränzl. in Engl., Pflanzenr. 45: 128. 1910 p.p.

Thai material examined: Peninsular floristic region: Krabi/Trang, near Boh Meung, 2002 (*sine coll./cult. Stocker s.n. C.*).

Additional material examined: MALAYSIA: Peninsular Malaysia, Perlis, Langkawi, Kuah (200 m alt.), 20 June 1932 (*Kerr 1010 K*).

Notes: The type of *D. lankaviense* was prepared from a plant (from an unspecified locality on Langkawi) that flowered in cultivation at Singapore Botanic Gardens in October 1901 (*sine coll., comm. Fox s.n.*; holotype SING). The type of *D. exilicaule* was collected from Ayer Hangat on Langkawi in November 1901 (*Curtis s.n. SING*). Judging from the protologues, from photocopies of the types, from Seidenfaden and Wood's (1992: Figs. 167d-e, 170a-c) illustrations of both taxa and from examination of Kerr 1010 (see above), we have no doubt that *D. lankaviense* and *D. exilicaule* are conspecific and that the Thai plant belongs to the same species. Until now, *D. lankaviense* (including *D. exilicaule*) has been considered endemic to Langkawi in Peninsular Malaysia (Seidenfaden and Wood 1992). The Thai locality, where *D. lankaviense* was found growing terrestrially on a limestone hill, is situated c. 150 km north of Langkawi.

*Cymbidium tigrinum* Parish ex Hook., Bot. Mag. 90: Pl. 5457. 1864 Fig. 3

*Cyperorchis tigrina* (Parish ex Hook.) Schltr., Repert. Spec. Nov. Regni Veg. 20: 108. 1924.

Thai material examined: Northern floristic region: Phitsanulok, Phu Soi Dao, 2200 m alt., 10 November 2004, flowering at Romklao Plant Collection Centre March 2005 (*Suddee et al. 2160 BKF*).

Notes: Until now *C. tigrinum* has been known from Myanmar, Nagaland and western Yunnan (Du Puy and Cribb, 2007). Additionally, Seidenfaden (1983) recognized it as member of the Thai orchid flora, based on an old record by Berkeley from "the Siamese frontier" (Hooker, 1890–1894: 10). However, it remains unknown if Berkeley made his find in Thailand or Myanmar, for which reason the new collection from Phu Soi Dao in Phitsanulok represents the first confirmed record of this species from Thailand. The Thai plants were collected in hill evergreen forest by staff from Romklao Plant Collection Centre in 2004. A spirit collection was prepared from individuals that the first author found



Fig. 3. *Cymbidium tigrinum*, originally collected from Phu Soi Dao, flowering at Romklao Plant Collection Centre, March 2005. A spirit sample (*Suddee et al. 2160*) was subsequently prepared from the same plant. Photo by H. Æ. Pedersen.

flowering in cultivation, when he stayed with Thai colleagues at the centre during field work the following year.

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## 泰國蘭科植物誌 (一)

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摘要：目前籌備中的泰國植物誌，有關蘭科部份的整理，在研究中發現一些新的分類群，報導於本篇文章內。包括 *Hetaeria armata* 為新種，並紀錄一新的 *Sirindhornia* 之天然雜交種，另有 *Odontochilus uniflorus* 則為新組合名。新紀錄種有 *Odontochilus macranthus*, *Cheirostylis moniliformis* 以及 *Dendrobium lankaviense*。本文亦確認先前報導之 *Zeuxine violascens* 與 *Cymbidium tigrinum* 為泰國原種。

關鍵詞：*Cheirostylis moniliformis*, *Cymbidium tigrinum*, *Dendrobium lankaviense*, *Hetaeria armata*, *Odontochilus uniflorus*, *Odontochilus macranthus*, Orchidaceae, *Sirindhornia mirabilis* × *monophylla*, *Zeuxine violascens*.