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'*Habenaria limprichtii*' (Orchidaceae) in Thailand, encompassing two distinct species

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ABSTRACT

A *Habenaria* species in northern Thailand is widely known as *H. limprichtii* Schltr., but most specimens are in fact referable to *H. yuana* Tang & F.T.Wang. This incorrect identification was first pointed out in one Thai specimen by Ormerod & Sathish Kumar (2008) in a study of Myanmar orchids, and is confirmed in re-examinations of a large number of Thai specimens in the present study. However, the study revealed that true *H. limprichtii* also occurs in Thailand, although it is very rare. The two species are superficially similar but are distinct in details of their flower morphology. Descriptions, a key to the species, and illustrations are provided.

KEYWORDS: *Habenaria yuana*, *H. limprichtii*, misapplied name, northern Thailand.

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INTRODUCTION

A large-flowered and rather attractive *Habenaria* species in northern Thailand is widely known as *H. limprichtii* Schltr. However, it was recently shown that this name is incorrectly applied to the species as the plant is actually referable to *H. yuana* Tang & F.T.Wang (as originally pointed out by Ormerod & Sathish Kumar, 2008: 78). The incorrect name *H. limprichtii* is the result of a misidentification that was made by G. Seidenfaden (Seidenfaden & Smitinand, 1965; Seidenfaden, 1977), and this name was subsequently adopted by all authors working on the group (including the treatment of *Habenaria* for Flora of Thailand). In addition, the name *H. limprichtii* has sometimes also been incorrectly applied to specimens of *H. yuana* from China, Myanmar and Vietnam. All available specimens of Thai '*Habenaria limprichtii*' were here re-examined and almost all of them were identified as *H. yuana*. But this examination revealed that true *H. limprichtii* also occurs in Thailand (although it is very rare in the country), thus indicating that '*H. limprichtii*' in the sense of Seidenfaden (1977) encompassed two different species, i.e. is a mixture of two species.

As the incorrect name is still widely applied to this plant, I am publishing this article to clarify the identity of the Thai specimens of '*Habenaria limprichtii*'. All cited specimens have been seen by the author (except for the type specimen of *H. oligoschista* Schltr.).

KEY TO THE SPECIES

Petals with prominent basal anterior lobe; flowers green, yellow-green or greenish white, rarely petals and lip partly or entirely white; lobules of lip side lobes 10 or more **1. H. yuana**

Petals obliquely oblong, basally not dilated; sepals green or greenish white, petals and lip white; lobules of lip side lobes 6−10 **2. H. limprichtii**

DESCRIPTIONS

1. Habenaria yuana Tang & F.T.Wang, Bull. Fan Mem. Inst. Biol. 7: 135. 1936; Ormerod & Sathish Kumar, Rheedea 18: 78. 2008; Chen & Cribb, Fl. China 25: 154. 2009; Tanaka *et al*., Bull. Natl. Mus. Nat. Sci., Ser. B, 41(2): 82. 2015. Type: China, Sichuan, Si-Chang-Hsien, under bushes, 2600 m elev., 10 Aug. 1932, *Yü 1317* (holotype **PE!**). Fig. 1, 2A.

— *Habenaria limprichtii* auct., non Schltr.: Seidenf. & Smitinand, Orchids Thailand: 727. 1965; Seidenf., Dansk Bot. Ark. 31(3): 82, fig. 46. 1977; Seidenf., Opera Bot. 114: 57. 1992; Nanakorn & Watthana,

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Figure 1. *Habenaria yuana* Tang & F.T.Wang in its natural habitat in Chiang Rai Province, Thailand. Photos by Peter O’Byrne.

Queen Sirikit Bot. Gard. (Native Thai Orchids 2): 114−115. 2008; Kurzweil, Thai Forest Bull. (Bot.), Special Issue: 24, fig. 3. 2009, p.p.; Chen *et al*., Field Guide Orchid. China: 227, colour photo. 2009; Averyanov, Turczaninowia 13(2): 47, fig. 25a−b. 2010; Kurzweil, Fl. Thailand 12(1): 114, fig. 63, pl. VIII: 1. 2011, p.p.

— *Habenaria oligoschista* auct., non Schltr.: Seidenf. & Smitinand, Orchids Thailand: 44, fig. 32, t. II(2697). 1959.

Terrestrial herb, deciduous, erect, (15−)17–60 (−74) cm tall, entirely glabrous except for sometimes the tips of the leaves and some of the floral parts as indicated below. *Tubers* oblong, fleshy. *Cataphylls* 3, tubular, enveloping the stem up to 70 mm high. *Leaves* (3–)5–7, ovate, ovate-elliptic or lanceolate-elliptic, acute or acuminate, mucronate, with three pronounced veins, 6–14(–20) × 1.5–4 cm, spreading, cauline, scattered along the stem, basally amplexicaul, margins entire or papillose, surface usually glabrous but rarely sparsely hairy near the tip. *Sterile bracts* of inflorescence axis not present. *Inflorescences* lax to semi-dense, with (2–)4−10 flowers; rachis (3–)5–17 cm long; floral bracts lanceolate, apex acuminate, longer than the pedicel plus the ovary, 22–45 × 6–12(–19) mm, margins papillose. *Flowers* large, 34–43(–55) mm in diameter, green, yellow-green or greenish-white, rarely petals and lip partly or entirely white. *Ovary* plus pedicel cylindric-fusiform, 19–33 mm long, with papillose or shortly hairy keels. Sepals subacute to acuminate, glabrous. *Median sepal* erect, elliptic or oblong-elliptic, 5-veined, concave, 19–28 × 8–15(–20) mm; lateral sepals spreading and distal parts slightly recurved, obliquely elliptic-lanceolate to obliquely oblong, 3−5-veined, 19–27 × 6–7.5(–9) mm. *Petals* erect, forming a hood with the median sepal, obliquely subovate-falcate and basally strongly dilated with a broadly rounded lobe on the anterior side, 5−6-veined, 20–23 × 8–11 mm, lamina glabrous but anterior margin slightly ciliate. *Lip* 22–35 × 15–20 mm, deeply 3-lobed, with an undivided stalk 9–12 mm long, spurred, lobes more or less ciliate; midlobe oblong or linear, spreading or somewhat deflexed, 15–18(–25) × 1.3–2 mm; side lobes linear or oblong, 17−22 × 1−1.9 mm, outer margin with 10 or more filiform side branches 3−7 mm long, side branches sometimes branched further; spur cylindric and apically clavate, shorter than the ovary, 14–25 mm long, glabrous. *Column* 3–5 mm tall; anther thecae positioned on the far corners of an elongate horseshoe-shaped connective to 15 mm wide, anther locules small, about 3 mm long, anther canals 3–4 mm long, slender, sharply bent upwards; stigmatic processes linear, clavate, to 7 mm long, sharply bent upwards. *Capsule* not seen.

Thailand [22 collections examined].— NORTHERN: Chiang Mai [Doi Suthep, 1325 m, 20 July 1921, *Kerr 92* (**K**); idem., 1650 m, 5 Aug. 1958, *Sørensen et al. 4557* (**BKF**, **C**); idem., 1550 m, 9 Sept. 1958, *Sørensen et al. 4855* (**C**); idem., 1500 m, 19 Aug. 1963, *Smitinand & Sleumer 8300* (**BKF**); idem., 1450 m, 25 July 1988, *Maxwell 88-917* (**L**); idem., 1200−1400 m, 19 Sept. 1995, *Larsen et al. 46681* (**AAU**); idem., without date, *Seidenfaden & Smitinand 2705* (**C** [spirit]); Doi Pui, 1400 m, 14 July 1989, *Songkakul 67* (**BKF** [spirit]); Mae Rim, 30 Aug. 1996, *Nanakorn et al. 6981* (**QBG**); idem., 1400 m, 2 Aug. 2007, *Watthana 2418* (**QBG** [spirit]); Doi Phanom Pok, 1885 m, 25 Aug. 2006, *Damapong 78* (**BKF** [spirit]); idem., 1657 m, 30 Sept. 2006, *Damapong 97* (**QBG**, **BKF**); Doi Pa Kao, ca 1800 m, 2 Sept. 1931, *Garrett 715* (**AMES**, **BK**, **K**, **P**); Ang Khang, 1780 m, 23 Sept. 2007, *Trisarasri et al. 319* (**BKF** [spirit]); Hot District, 1100 m, 8 July 1995, *Pooma 1034* (**BKF**); idem., 8 Sept. 1995, *Pooma s.n.* (**BKF** [spirit]); Doi Inthanon National Park, 2200 m, 6 Sept. 1998, *Suksathan 1199* (**QBG** [spirit]); idem., 2300 m, 22 Sept. 2001, *Suksathan 3085* (**QBG**); idem., 2000 m, 7 Sept. 2010, *Watthana 3550* (**QBG** [spirit])]; Chiang Rai [Wiang Kaen District, 1485 m, 23 Oct. 2012, *La-ongsri et al. 2489* (**QBG**); idem., 1440 m, Aug. 2015, *O'Byrne CHR001*, photographic record]; Phitsanulok [Phu Soi Dao National Park, 1600 m, 14 Aug. 2000, *Suksathan 2707* (**QBG**)].

Distribution.— Myanmar (Chin and Shan States, Mandalay Region), SW China (S Yunnan, W Sichuan), Vietnam.

Ecology and phenology.— In Thailand the species is found in open areas in pine and broad-leaved forest as well as in grassland at an elevation of 1100–2300 m, and is in flower during the rainy season from July to September (once recorded in October).

Conservation.— The species is known from at least 22 collections made in northern Thailand in Chiang Mai, Chiang Rai and Phitsanulok Provinces,

with several of them situated inside conservation areas. It is here assumed that several of the Thai '*Habenaria limprichtii*' which were not available for the present re-examination in fact also belong to *H. yuana*. The species also does not fall into the threatened category in neighbouring Myanmar, where several localities are also situated inside conservation areas (Natma Taung National Park in Chin State, Popa Mountain Park in Mandalay Region). Therefore the conservation status Least Concern (LC) is proposed here.

Previously, the conservation status of the species has been assessed as Vulnerable A2c (http://www.iucnredlist.org/search; accessed 16 Sept. 2016) although a note 'needs updating' suggests that this status needs to be reviewed.

Etymology.— Named in honour of the collector, T.T.Yü.

Notes.— This plant was originally referred to *Habenaria oligoschista* (Seidenfaden & Smitinand, 1959: 44), based on an identification at Kew by V.S. Summerhayes. Following the advice given by Prof. Tang it was later re-identified as *H. limprichtii* Schltr. (Seidenfaden & Smitinand, 1965: 727). In the latter publication it was also stated that the two species hardly differ. Interestingly, at one time *H. oligoschista* had indeed merely been considered a variety of *H. limprichtii* (Soó von Bere, 1929: 372). Currently *H. oligoschista* and *H. limprichtii* are considered conspecific (Chen & Cribb, 2009: 153; Govaerts *et al.*, 2016). The name *H. limprichtii*, which had been introduced for this plant by Seidenfaden & Smitinand (1965), was adopted by several students of the Thai orchid flora, such as Seidenfaden (1977), Nanakorn & Watthana (2008) and Kurzweil (2009, 2011).

However, both *Habenaria limprichtii* and *H. oligoschista* differ markedly from the Thai plants in the shape of their petals, which are obliquely oblong in *H. limprichtii* and *H. oligoschista*, whereas almost all Thai plants have basally strongly dilated petals with a prominent anterior lobe. One of the Thai collections (*Garret 715*) was therefore identified as *H. yuana* Tang & F.T.Wang in a publication on Myanmar orchids (Ormerod & Sathish Kumar, 2008: 78). Unfortunately this publication was apparently overlooked by most botanists working on the orchids of Thailand. A re-examination of all of the available herbarium and spirit material in the present study confirmed this identification also for a number of other Thai specimens. No significant variation in the petal shapes of *H. yuana* and *H. limprichtii* could be found, and it is therefore concluded that the two species are distinct, and that the commonly used name *H. limprichtii* is incorrectly applied to this species. Interestingly, the study also revealed the occurrence of true *H. limprichtii* in Thailand (see below).

Additional distinguishing features between *H. yuana* and *H. limprichtii* are the flower colour (green, yellow-green or greenish white, petals and lip rarely partly or entirely white in *H. yuana*; sepals green or greenish white, petals and lip apparently consistently white in *H. limprichtii*) and the number of filiform lobules of the lip side lobes (10 or more in *H. yuana*; 6−10 in *H. limprichtii*). There are also several differences between the two species in other sets of characters but these are tentative and overlap. A comparison of some diagnostic features of the two species is given in Table 1.

In Thailand, *Habenaria yuana* is far more common than *H. limprichtii*. Twenty-two out of 24 specimens of *H. limprichtii*-lookalikes examined here were identified as belonging to the former species. In contrast, only one out of these 24 specimens was correctly identified as *H. limprichtii* while the identification of a second specimen is uncertain.

Among the other *Habenaria* species with basally dilated petals and a 3-lobed lip with laciniate side lobes, the widespread Himalayan *H. arietina* Hook.f. differs by its adaxially pubescent petals. *H. intermedia* D.Don, another widespread Himalayan species, also shares the basally dilated petals but differs by few-flowered inflorescences, long lip spur (7−8.5 cm) and anther with a narrow connective.

2. Habenaria limprichtii Schltr., Repert. Spec. Nov. Regni Veg. Beih. 4: 50. 1919; Chen & Cribb, Fl. China 25: 153. 2009; Chen *et al*., Fl. China Illustr. 25: fig. 203.1−4. 2010. *Habenaria pectinata* D.Don var. *limprichtii* (Schltr.) Pradhan, Indian Orchids: Guide Ident. & Cult. 1: 72. 1976. Type: China, Yunnan, Talifu, Bergwiesen des Tsang schan, 2500−3000 m elev., Aug. 1913, *Limpricht 1024* (holotype **B**, destroyed; isotype **WU!**). Fig. 2B.

— *Habenaria oligoschista* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 4: 51. 1919. Type: China, Guizhou, Pin-Fa, July 1902, *Esquirol s.n.* (not located).

Table 1. Various features of *Habenaria yuana* Tang & F.T.Wang and *H. limprichtii* Schltr. Data after the Thai specimens, Chen & Cribb (2009), Kurzweil (2009, 2011), as well as the protologues.

	Habenaria yuana Tang & F.T.Wang	*Habenaria limprichtii* Schltr.
leaf size	6–14(–20) × 1.5–4 cm	4–10 × 1.5–3 cm
flower number	(2–)4−10	(1−)3−20
floral bracts	lanceolate, 22–45 × 6–12(–19) mm	ovate-lanceolate or elliptic, 30–40 × ca 10 mm
flower colour	flowers green, yellow-green or greenish white, petals and lip rarely partly or entirely white	sepals green or greenish white, petals and lip white
length of ovary plus pedicel	19–33 mm	18–25 mm
sepal length	19–28 mm	18–21 mm
petal shape	obliquely subovate-falcate, with prominent basal anterior lobe	obliquely oblong
petal size	20–23 × 8–11 mm	18–22 × 4–5.5 mm
length lip midlobe	15–18(–25) mm	14–15 mm
lobules of lip side lobes	10 or more	6−10
lip spur length	14–25 mm	18–30 mm
anther connective width	to 15 mm	8−12 mm
known distribution	Thailand, Myanmar, SW China, Vietnam	SW China, Thailand
flowering time in Thailand	beginning of July to end of September; once recorded in October	first half of July

Very similar to *Habenaria yuana* but differing in its flower structure and colour. The most distinctive difference between the two species are the petals which are obliquely oblong and 4–5.5 mm wide in *H. limprichtii*, but subovate-falcate and basally strongly dilated to 8–11 mm in *H. yuana*. While the sepals are green or whitish green in both species, petals and lip are apparently consistently white in *H. limprichtii*, and greenish or rarely partly or entirely white in *H. yuana*. The lip side lobes differ somewhat in the two species, having 6−10 filiform lobules in *H. limprichtii* as opposed to 10 or more in *H. yuana*. Many specimens of *H. limprichtii* also differ from *H. yuana* by smaller but more numerous flowers, by longer lip spurs and a narrower anther connective.

Thailand [2 collections examined].— NORTHERN: Chiang Mai [Doi Chiang Dao, 2100 m, 9 July 1998, *Pongamornkul 393* (**QBG**)]; Nan [Doi Phu Kha National Park, 1800 m, 4 July 1999, *Srisanga et al. 871* (**QBG**), identification uncertain].

Distribution.— SW China (Yunnan, Sichuan, Hubei, Guizhou).

Ecology and phenology.— In Thailand occurring in evergreen montane forest at 1800−2100 m, the two collections known so far were found in flower in July.

Conservation.— Apparently rare in Thailand as seen by the very small number of collections. As only two collections are available (only one of them reliably identified), a conservation assessment using IUCN categories is not attempted here.

Etymology.— The species is named after its collector, Dr W. Limpricht.

Notes.— The identification of the species is based on spur length, petal shape and hairiness, and connective width (after Chen & Cribb, 2009; Pearce & Cribb, 2002; as well as the protologues and type specimens of this and the similar species).

Only the collection *Pongamornkul 393* is here reliably identified. The single plant in the second collection, *Srisanga et al. 871*, is a depauperate, small specimen with a single flower. Although it shares the flower size, the obliquely oblong petals and the lip spur length with *Habenaria limprichtii*, the column was not examined in order not to dissect the single flower, and the identification is therefore uncertain.

A FEW NOTES ON THE *HABENARIA PECTINATA* GROUP

Habenaria yuana and *H. limprichtii* belong to a group of about eight or nine species related to *H. pectinata* D.Don, which are concentrated in the Himalayas and their foothills in northern Myanmar and south-western China. The species belong to *H.* sect. *Multipartitae* Kraenzl., characterised by entire petals and 3-lobed lip with laciniate side lobes. The delimitation of the species and their relationships are poorly understood as yet, and a thorough study based on morphometric and molecular data is much needed. It is possible that such a study may eventually show that some of the species should be considered merely forms of *H. pectinata* (see also Seidenfaden, 1977: 82), which was in some species already proposed by Kraenzlin (1898: 405), Finet (1901: 531), Soó von Bere (1929: 373−374) and Pradhan (1976: 72).

Two subgroups within the *Habenaria pectinata* group, a long-spurred and a short-spurred group, were distinguished by Seidenfaden (1977: 84). Spurs longer than 40 mm characterise the long-spurred group which comprises *H. intermedia* D.Don, *H. leucopecten* Schltr. (now considered a synonym of *H. davidii* Franch.; Govaerts *et al*., 2016; Chen & Cribb, 2009), *H. chloropecten* Schltr. (now also considered a synonym of *H. davidii*; Govaerts *et al*., 2016; Chen & Cribb, 2009) and *H. arietina* Hook.f. On the other hand, spurs of up to 26 mm characterise the short-spurred group comprising *H. triquetra* Rolfe, *H. limprichtii*, *H. ensifolia* Lindl. (accepted by Govaerts *et al*., 2016; considered a synonym of *H. pectinata* by Chen & Cribb, 2009, and Pearce & Cribb, 2002), *H. yuana*, *H. oligoschista* (now considered a synonym of *H. limprichtii*; Govaerts *et al*., 2016; Chen & Cribb, 2009), *H. pectinata* and *H. mairei* Schltr.

On the basis of their examination of a large number of specimens in the Himalayan region, Pearce & Cribb (2002: 152) distinguished three groups within the region: (a) the *H. pectinata* group with glabrous petals and a short, clawed lip base; (b) the *H. arietina* group with linear-lanceolate leaves, basally gibbous pubescent petals and upturned linear stigmatic processes; and (c) the *H. intermedia* group with ovate-elliptic leaves, basally flat pubescent petals and longer, hastate, projecting stigmatic processes. Pearce & Cribb (2002) did not list the species belonging to these groups.

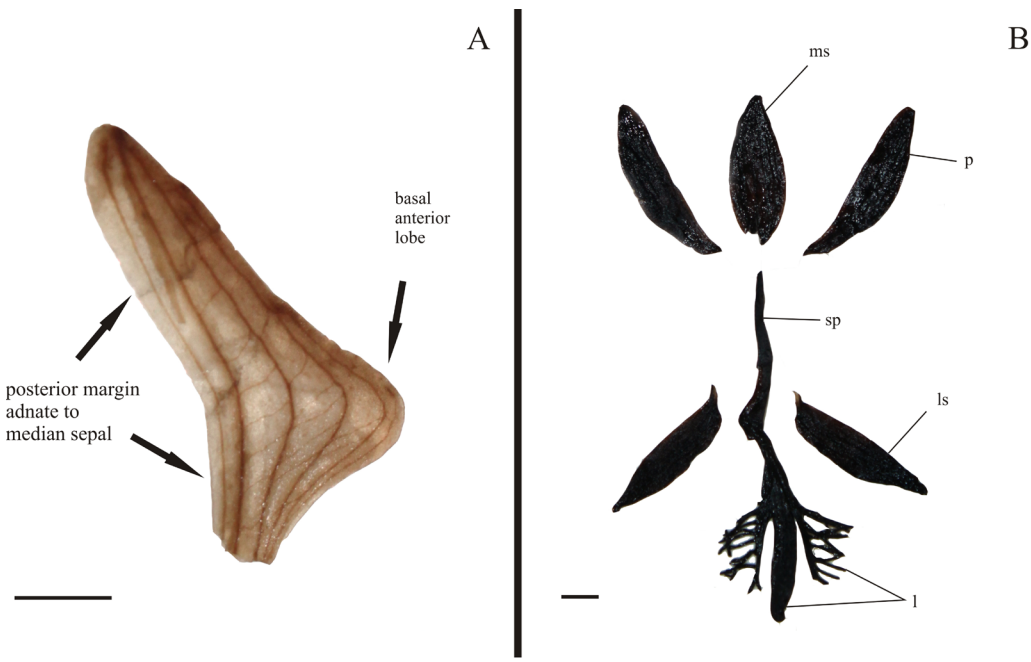

Figure 2. A. *Habenaria yuana* Tang & F.T.Wang, petal. From *Watthana 2418* (QBG [spirit]); B. *H. limprichtii* Schltr., floral dissection (l = lip, ls = lateral sepal, ms = median sepal, p = petal, sp = lip spur). From *Pongamornkul 393* (QBG). Scale bars 5 mm. Photos by H. Kurzweil.

As pointed out by Ormerod (Ormerod & Sathish Kumar, 2008; Ormerod, pers. comm.), the basal anterior petal lobes are critical in the systematics of the *H. pectinata* group; therefore a future taxonomic treatment of the group will also need to consider this character.

Molecular studies of the group with complete sampling are not available as yet. As could be expected, in the only study which includes a species of the *Habenaria pectinata* group, the Asian alpine *H. intermedia* is resolved as sister to the African montane *H. praestans* Rendle (Jin *et al*., 2014) (both species belong to *H.* sect. *Multipartitae*).

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REFERENCES

Chen, X. & Cribb, P.J. (2009). *Habenaria*. In: Z. Wu, P.H. Raven, & D. Hong (eds), Flora of China 25: 144–160. Science Press, Beijing; and Missouri Botanical Garden Press, St. Louis.

Finet, M.E.A. (1901). Les Orchidées de l'Asie Orientale. Revue Générale de Botanique 13: 497−534.

Govaerts, R., Bernet, P., Kratochvil, K., Gerlach, G., Carr, G., Alrich, P., Pridgeon, A.M., Pfahl, J., Campacci, M.A., Holland Baptista, D., Tigges, H., Shaw, J., Cribb, P., George, A., Kreuz, K. & Wood, J.J. (2016). World Checklist of Orchidaceae. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; http://apps.kew.org/wcsp/. Last retrieved 17 June 2016.

Jin, W.-T., Jin, X.-H., Schuiteman, A., Li, D.-Z., Xiang, X.-G., Huang, W.-C., Li, J.-W. & Huang, L.-Q. (2014). Molecular systematics of subtribe Orchidinae and Asian taxa of Habenariinae (Orchideae, Orchidaceae) based on plastid *matK*, *rbcL* and nuclear ITS. Molecular Phylogenetics and Evolution 77: 41–53.

Kraenzlin, F. (1898). Orchidacearum Genera et Species I. Mayer & Müller, Berlin, 986 pp.

Kurzweil, H. (2009). The genus *Habenaria* (Orchidaceae) in Thailand. Thai Forest Bulletin (Botany), Special Issue: 7–105.

_____. (2011). *Habenaria*. In: T. Santisuk & K. Larsen (eds), Flora of Thailand 12(1): 79–149. The Forest Herbarium, Bangkok.

Nanakorn, W. & Watthana, S. (2008). Queen Sirikit Botanic Garden (Thai Native Orchids 2). Wanida Press, Chiang Mai.

Ormerod, P. & Sathish Kumar, C. (2008). Orchidaceous additions to the Flora of Myanmar 2. Rheedea 18(2): 75−80.

Pearce, N. R. & Cribb, P. J. (2002). Flora of Bhutan including a record of plants from Sikkim and Darjeeling 3(3). The Orchids of Bhutan. Royal Botanic Garden Edinburgh & Royal Government of Bhutan, 643 pp.

Pradhan, U.C. (1976). Indian Orchids: Guide to Identification and Culture. Vol. 1. Published privately, 188 pp.

Seidenfaden, G. (1977). Orchid Genera in Thailand V. Orchidoideae. Dansk Botanisk Arkiv 31(3): 1–149.

Seidenfaden, G. & Smitinand, T. (1959). The Orchids of Thailand – A Preliminary List. Part I: 1−98. The Siam Society, Bangkok.

_____. (1965). The Orchids of Thailand – A Preliminary List. Part IV(2): 647−870. The Siam Society, Bangkok.

Soó von Bere, R. (1929). Revision der Orchideae-Ophrydineae von Ostasien und dem Himalaya. Annales Historico-naturales Musei Nationalis Hungarici 26: 339−384.