

# The genus *Micropera* (Orchidaceae: Aeridinae) in Thailand

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**Abstract:** The genus *Micropera* Lindl. (Orchidaceae: Aeridinae) is revised for Thailand based on herbarium specimens, a literature review, and field observations. Six taxa are recognized, including two new country records. A taxonomic key to species, descriptions, notes, illustrations, and colour photographs are provided.

**Key words:** Flora of Thailand, new records, orchid taxonomy.

## Introduction

The genus *Micropera* Lindl. belongs to subtribe Aeridinae (Orchidaceae, Vandae) and comprises 22 species distributed from Southeast Tibet to Tropical Asia and the West Pacific with a centre of diversity in Southeast Asia (POWO, 2023). They are epiphytes in evergreen or semi-evergreen forests, and often grow on cultivated trees and large roadside trees from sea level to 1200 m elevation (Wood *et al.*, 2014). The genus was described by Lindley (1832), who included only one species, *M. pallida* (Roxb.) Lindl. Its basionym *Aerides pallida* Roxb. was based on a painting of a plant collected either in Chittagong (Bangladesh), or West Bengal (India), by Roxburgh. The following year, Lindley (1833) proposed the genus *Camarotis* Lindl. to accommodate another species now included in *Micropera*. He later considered *Micropera* and *Camarotis* to be congeneric but favoured the younger generic name by designating *Micropera* a synonym (Lindley, 1858). The name *Camarotis* had been accepted for a long time, *e.g.*, by King and Pantling (1898), Prain (1903), and Seidenfaden and Smitinand (1965), until Tang and Wang (1951), Garay (1972) and Seidenfaden (1988)

adopted *Micropera*. Seidenfaden and Smitinand (1965) enumerated four species in Thailand under *Camarotis*.

*Micropera* is characterized by an epiphytic habit with monopodial growth, elongated, sometimes sub-scandent stems, racemose or sometimes paniculate inflorescences, usually non-resupinate flowers, a lip with a saccate hypochile with back and front wall calli and longitudinal septum, and a column with a beaked rostellum which is sometimes twisted sideways (Chen & Wood, 2009; Wood *et al.*, 2014). Based on DNA data (Kocyan *et al.*, 2014), *Micropera* was found to be a member of the *Cleisostoma* alliance, where it also fits in floral morphology, having a longitudinal septum and calli in the labellum spur. However, generic delimitation in this alliance is still uncertain (Wood *et al.*, 2014).

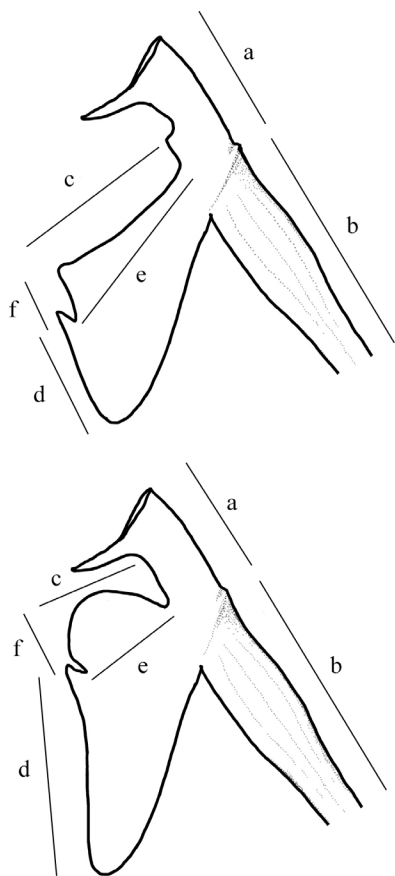
The latest taxonomic account of *Micropera* in Thailand was published by Seidenfaden (1988), with generic notes, a key to the species, illustrations, species notes, distribution data and specimen citations, but without descriptions. While preparing the present revision, specimens of *Micropera* were collected in Southern Thailand by SWJ and identified as *M. callosa* (Blume) Garay and *M. fuscolutea* (Lindl.) Garay, which represent new records for Thailand. Here, we present an updated taxonomic enumeration of the genus *Micropera* as a contribution to the Flora of Thailand project.

## Materials and Methods

The present study is based on morphological evidence. The herbarium specimens and spirit collections of *Micropera* from the Thai Forest Herbarium (BKF), Copenhagen Herbarium (C), Kew Herbarium (K), Queen Sirikit Botanic

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**Fig. 1.** Line drawing illustration showing measurements of the flower of *Micropera*, the top and lower diagram showing the different forms of the labellum: a. Column length; b. Pedicel and ovary length; c. Labellum length; d. Spur length; e. Lateral lobe width; f. Lateral lobe length (drawn by Thotsaporn Chanokkhum).

Garden Herbarium (QBG), and Prince of Songkla University (PSU) were studied, along with the materials resulting from our fieldwork. Figure 1 shows how the various flower parts were measured. We followed a traditional, morphological species concept (Van Steenis, 1957; Davis & Heywood, 1963) according to which species are distinguished by discontinuous variation in two or more independent characters. Specimen data were used to compile information on the phenology, fruiting period, habitat and distribution in Thailand. Specimens or images of types seen are indicated by an exclamation mark.

### Taxonomic Treatment

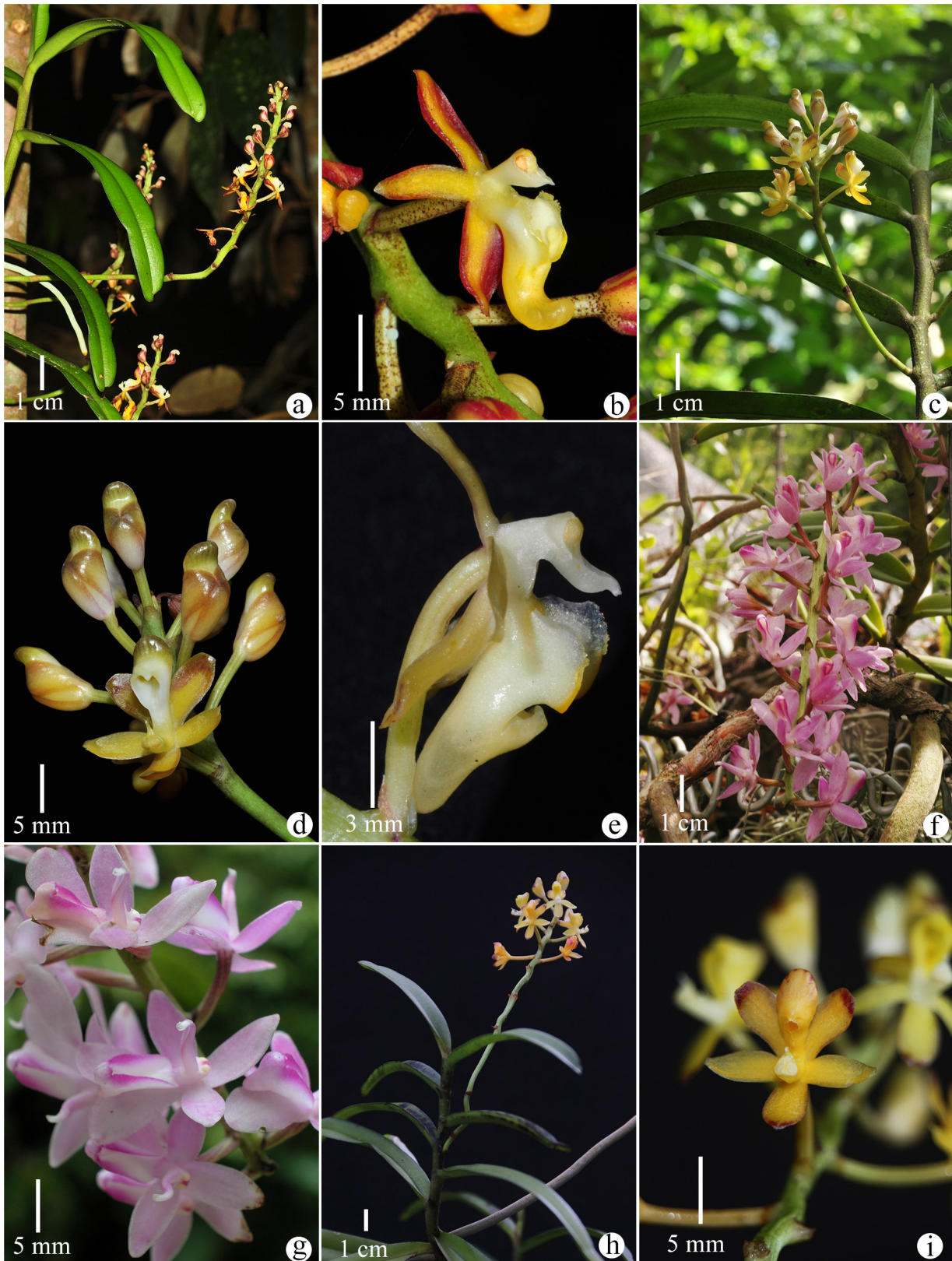
*Micropera* Lindl., Edwards's Bot. Reg. 18: sub t. 1522. 1832; Seidenf., Opera Bot. 95: 120. 1988; J.B.Comber, Orchids Java 343. 1990; N.Pearce & P.J.Cribb, Fl. Bhutan 3(3): 531. 2002; Wood *et*

*al.*, Gen. Orchid. 6: 210. 2014. *Camarotis* Lindl., Gen. Sp. Orchid. Pl. 219. 1833; Holttum, Orchids Penins. Malaysia Singapore 633. 1957; Smith, Natuurk. Tijdschr. Ned.-Indië 72: 79–115. 1912; Kerr, J. Siam Soc., Nat. Hist. Suppl. 9, 2: 225–243. 1933. Type: *Micropera pallida* (Roxb.) Lindl.

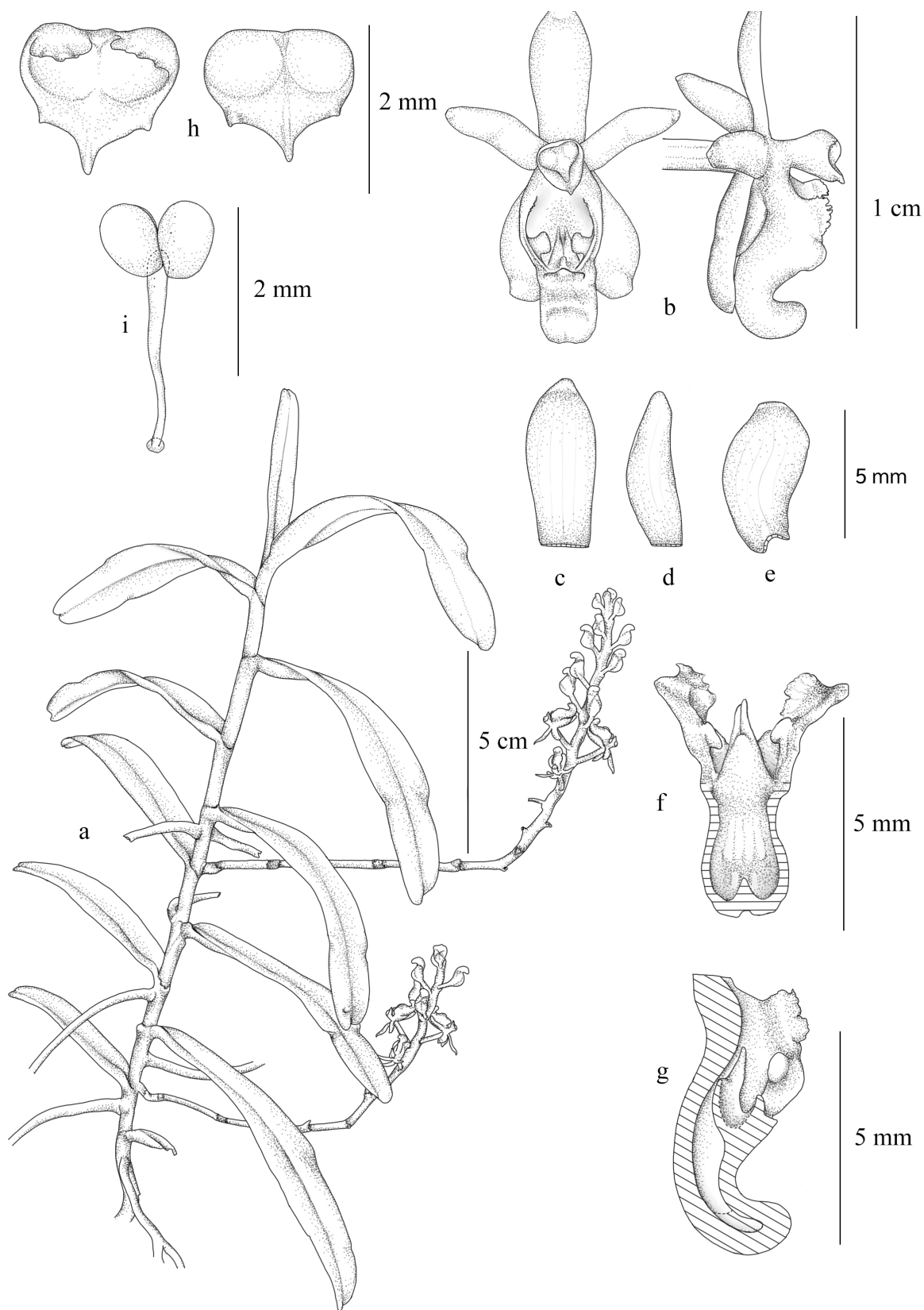
Monopodial epiphytic herbs, climbing; stems long, terete, with many long roots and leaves. Leaves distichous, flat, conduplicate, usually many, dorsiventrally compressed, fleshy, oblong to linear, basal part forming a tubular sheath covering the stem, articulate, apex equally or unequally bilobed. Inflorescence lateral, racemose, sometimes paniculate, few- to many-flowered, often arising opposite leaves. Flowers usually non-resupinate, up to c. 1.5 cm across, (pale-)yellow or light pink. Sepals and petals free, similar. Labellum conspicuously spurred or saccate, 3-lobed; lateral lobes broad, erect; mid-lobe smaller, fleshy; spur with a longitudinal septum inside, often with callosities at its entrance. Column stout to slender, lacking a foot; rostellum projection prominent, beaked, sometimes twisted; anther rostrate, pollinia 4, in 2 sub-equal pairs on a common long stipe; viscidium elliptic, very small. Fruit a capsule; seeds numerous.

### Key to the species of *Micropera* in Thailand

1. Lip pinkish purple; rostellum >4 times longer than column height, sigmoid in lateral view, not strongly twisted sideways ..... *M. rostrata*
1. Lip yellow; rostellum <3.5 times as long as column height, straight or strongly twisted sideways ..... 2
2. Rostellum strongly twisted sideways (through about 90 degrees) ..... *M. obtusa*
2. Rostellum straight or only slightly twisted sideways ..... 3
3. Side lobes of labellum conspicuous, more or less quadrangular ..... 4
3. Side lobes of labellum inconspicuous ..... 5
4. Spur strongly incurved ..... *M. callosa*
4. Spur (sub-)straight ..... *M. pallida*
5. Mid-lobe of labellum with a raised callus ..... *M. fuscolutea*
5. Mid-lobe of labellum without distinct callus .... *M. thailandica*



**Fig. 2.** Photographic images of *Micropera* spp.: a & b. *M. callosa* (Blume) Garay: a. Habit; b. Flower; c & d. *M. fuscolutea* (Lindl.) Garay: c. Habit; d. Inflorescence; e. *M. pallida* (Roxb.) Lindl. flower; f & g. *M. rostrata* (Roxb.) N.P.Balacr.: f. Inflorescence; g. Flowers; h & i. *M. thailandica* Garay ex Seidenf.: h. Habit; i. Flower (photos a-d by J. Sae Wai; e-g by S. Watthana; h-i by T. Channokhun).



**Fig. 3.** Line drawings of *Micropera callosa* (Blume) Garay: a. Plant; b. Flower—front and side views; c. Dorsal sepal; d. Petal; e. Lateral sepal; f & g. Section through labellum: f. Front view; g. Side view; h. Operculum—below view and top view; i. Pollinarium (from J. Sae Wai 2320; drawn by Thotsaporn Chanokkhun).

**Micropera callosa** (Blume) Garay, Bot. Mus. Leaf. 23: 186. 1972. *Cleisostoma callosum* Blume, Bijdr. Fl. Ned. Ind. 364. 1825. *Sarcanthus callosus* (Blume) Rchb.f., Bonplandia (Hannover) 5: 41. 1857. *Camarotis callosa* (Blume) J.J.Sm., Natuurk. Tijdschr. Ned.-Indië 72: 97. 1912. *Type*: INDONESIA, Java, Pantjar, Blume, C.L. *s.n.* (holo L [L0061626 digital image!]). **Figs. 2a-b & 3**

Stem up to 40 cm long, up to 0.6 cm in diam., covered by the rugose leaf sheaths; roots up to 0.35 cm diam. Leaves 2–3 cm apart, oblong-linear, 11–13 × 1.8–2 cm, apex unequally bilobed with rounded lobes, fleshy. Inflorescences upright, 15–21 cm long, 18–30-flowered; peduncle 5.5–10 cm long, with 2–3 sheathing peduncle scales 4–8 mm long; rachis 8–10 cm long, unbranched, ridged; bracts broadly triangular, 1–1.5 × 2.5–3 mm, obtuse. Flowers non resupinate, sepals and petals yellow with brownish red margin, lip orange yellow, sidelobe pale yellow, column white or cream; pedicel and ovary 9–11 mm long. Dorsal sepal oblanceolate, 7–7.3 × 2.8–3 mm, apex broadly obtuse, concave, fleshy, abaxial surface with scattered dark brown scale-hairs, adaxial surface glabrous; lateral sepals oblanceolate, 5.7–6 × 3.4–3.5 mm, adnate to column-foot, adaxial surface with dark brown scale-hairs, abaxial surface glabrous. Petals oblong-elliptic, up to 5.7–6 × 1.6–1.9 mm, obtuse to acute, slightly falcate, glabrous. Labellum fleshy, tubular, strongly incurved at distal part, 3.4–3.6 mm long, 7–7.5 mm high, distinctly 3-lobed; lateral lobes somewhat quadrangular, 3.3–3.5 × 2.9–3 mm, upper edges erose, with a small and rounded callus on each side; mid-lobe broadly triangular, thickened, 1–1.2 × 1.8–2 mm, apex acute with narrow conical callus adaxially; spur 3.7–4 mm long, apex narrowly rounded, with longitudinal septum, 1–1.2 mm high and an oblong, upright, horn-like, triangular, bilobed callus at base of mid lobe. Column rather stout, 3–3.3 mm long; rostellum beak-like, 1–1.1 mm long, slightly twisted. Anther 1.8–2 × 1.7–1.9 mm, with short beak. Fruit not seen.

*Flowering & fruiting*: Flowering in August; fruit not seen.

*Habitat*: Epiphyte on Durian trees.

*Distribution*: Borneo, Java, Sumatra, and Thailand.

*Specimen examined*: THAILAND, Yala, Betong,

Ban Chantharat, N 5°47'35", E 101°10'21", 230 m, 24.08.2013, J. Wai 2320 (PSU).

*Notes*: This species is a new record for Thailand and mainland Southeast Asia.

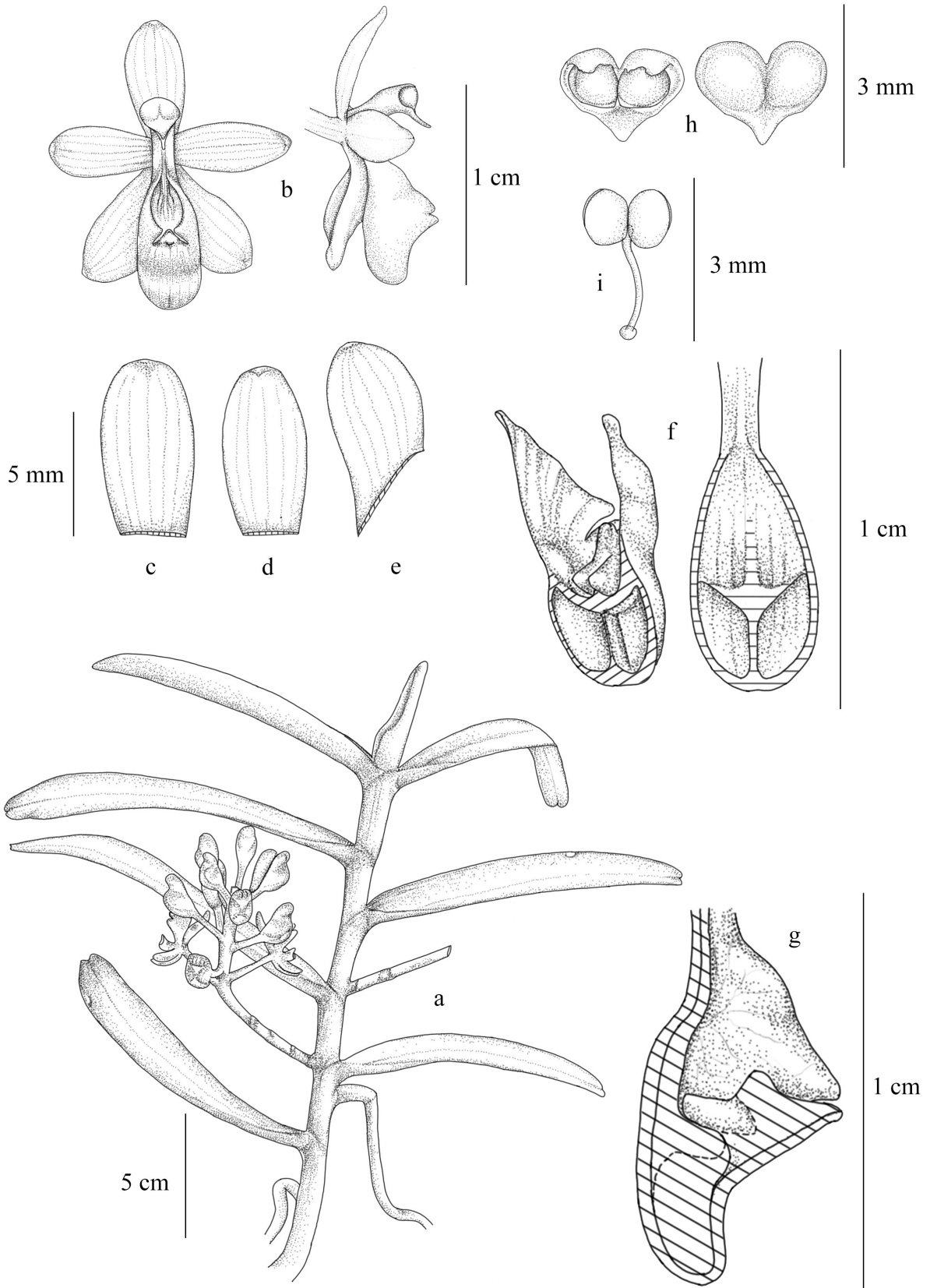
**Micropera fuscolutea** (Lindl.) Garay, Bot. Mus. Leaf. 23: 186. 1972; Seidenf. & Wood, Orchids Penins. Malaysia Singapore: 617, f. 280d–e. 1992. *Sarcochilus fuscoluteus* Lindl., Edwards's Bot. Reg. 33: sub t. 18. 1847. *Type*: BORNEO, Cult., March 1847, F.G. Cox (leg. Lowe [= Low]) *s.n.* (holo K-LINDL!).

*Sarcochilus adnatus* Ridl., J. Linn. Soc., Bot. 32: 373. 1896. *Saccolabium adnatum* (Ridl.) Ridl., Fl. Malay Penins. 4: 174. 1924. *Camarotis adnata* (Ridl.) Holttum, Gard. Bull. Singapore 11: 277. 1947. *Lectotype* (designated here): SINGAPORE, Toas district, *Goodenough s.n.* (SING [SING0056418 digital image!])

*Camarotis latisaccata* J.J.Sm., Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 187. 1927. *Type*: INDONESIA, Kalimantan, Kapoeas [Kapuas River], *s.d.*, *Teymann* 8445 (syn BO n.v., L [L0061627 digital image!]).

**Figs. 2c-d & 4**

Stem 40 cm or more long, up to 0.5 cm in diam., covered by rugose leaf sheaths; roots up to 0.35 cm in diam. Leaves 1.8–2 cm apart, oblong-linear, 7–15 × 1.5–2 cm, apex equally to unequally bilobed with rounded lobes, fleshy. Inflorescences more or less upright, 7–8.5(–20) cm long, several-flowered; peduncle 4.3–5.5(–10) cm long, with 2–3 sheathing peduncle scales 3–9 mm long, basal one much longer than others; rachis 2–2.5(–10) cm long, unbranched; bracts broadly triangular, obtuse, 1.8–2 × 1.5–2 mm. Flowers non resupinate, yellow or light orange-yellow, sepals sometimes tipped with brown, labellum yellow tinged with brown at base and white at apex of spur, column white or cream; pedicel and ovary 8–9 mm long. Dorsal sepal oblanceolate-oblong, 7.5–8.5 × 3.4–3.6 mm, apex broadly rounded, concave, fleshy; lateral sepals ovate-oblong 6.2–6.5 × 3.8–4 mm, oblique, apex rounded. Petals elliptic-oblong, 7–7.3 × 3–3.3 mm, obtuse. Labellum fleshy, deeply boat-shaped, 8.5–9 mm long, 4.7–5.2 mm high, obscurely 3-lobed; lateral lobes inconspicuous broadly triangular 5–5.3 × 0.9–1.3 mm, edges minutely serrate or entire; mid-lobe triangular, 1.8–2 × 2–2.3 mm, apex acute with broad cone



**Fig. 4.** Line drawings of *Micropera fuscolutea* (Lindl.) Garay: a. Plant; b. Flower—front and side views; c. Dorsal sepal; d. Petal; e. Lateral sepal; f & g. Section through labellum: f. Front view; g. Side view; h. Operculum— below and top views; i. Pollinarium (from *J. Sae Wai* 2184; drawn by Thotsaporn Chanokkhun).

callus; spur 4.3–5 mm long, with longitudinal septum and triangular callus at base of mid lobe, 1–1.2 mm long, deep-bilobed, with cone callus at middle of backwall. Column slender, 4.5–5.5 mm long; rostellum beak *c.* 2 mm long, not twisted. Anther 1.8–2 × 2–2.4 mm, with short beak. Fruit not seen.

*Flowering & fruiting:* Flowering in June and December; fruit not seen.

*Habitat:* Epiphyte on Durian trees.

*Distribution:* Thailand, Peninsular Malaysia, and Borneo.

*Specimens examined:* THAILAND, **Yala**, Betong, Ban Chantharat, N 5°47'35", E 101°10'21", 230 m, 19.06.2011, *J. Wai* 2082 (PSU); *Ibid.*, 29.12.2012, *J. Wai* 2184 (PSU).

**Micropera obtusa** (Lindl.) Tang & F.T.Wang, *Acta Phytotax. Sin.* 1: 94. 1951; Pradhan, *Indian Orchids* 1: 497. 1979; Seidenf., *Nordic J. Bot.* 2: 193–218. 1982; Christenson, *Amer. Orchid Soc. Bull.* 54: 955–958. 1985. *Sarcochilus obtusus* (Lindl.) Benth. ex Hook.f., *Fl. Brit. India* 6: 36. 1894. *Camarotis obtusa* Lindl., *Edwards's Bot. Reg.* 30: 73. 1844; Rchb.f., *Bot. Zeit.* 22,39: 881. 1864; *Trans. Linn. Soc. London* 30, 1: 136. 1874; King & Pantl., *J. Proc. Asiat. Soc. Bengal* 66, 3: 238. 1898; Smith, *Natuurk. Tijdschr. Ned.-Indië* 72: 97. 1912; Brühl, *Guide Orchids Sikkim* 141. 1926; Seidenf. & Smitinand, *Orchids Thailand* 714, Fig. 1–9. 1965; Hegde, *Arunachal Forest News* 3, 3: 7. 1980; *Orchids Arunachal Pradesh*: 76. 1984. *Type:* Cult., *s.d.*, *Loddiges (leg. Bateman) s.n.* (K-LINDL, not found, only a sketch by Reichenbach is preserved in Lindley's herbarium, we do not know if this was made after the type material).

Fig.

5

Stem 25–40 cm long *c.* 0.5 cm in diam., covered by dark, rugose leaf sheaths and with dark brown scale-hairs. Leaves *c.* 2 cm apart, oblong-linear, 6–9 × 1–1.5 cm, apex (sub-)unequally bilobed with rounded lobes, fleshy. Inflorescences pendent or pendent, 4–10 cm long, 6–20-flowered; peduncle 2–4 cm long, with 2–3 sheathing peduncle scales 3–4 mm long; rachis 3–6.5 cm long, unbranched; bracts broadly triangular, obtuse, 3–3.5 × 3.5–4 mm. Flowers non resupinate, pinkish or pale purplish, sepals white, sometimes tinged with pale

purple, labellum yellow, sometime whitish at base, column white with purplish apex; pedicel and ovary 9–10 mm long with dark brown scale-hairs. Dorsal sepal obovate, 6.5–7.8 × 3–3.5 mm, apex obtuse; lateral sepals obovate-oblong, 6.3–6.5 × 3.1–3.5 mm, slightly oblique. Petals oblanceolate-oblong, 7–7.5 × 2.5–3 mm, slightly falcate, obtuse. Labellum fleshy, deeply boat-shaped, 5–5.5 mm long, 4.8–5.2 mm high, obscurely 3-lobed; lateral lobes inconspicuous, broadly triangular, 3.8–4 × 1–1.5 mm; mid-lobe thickened, triangular with shortly 3-lobed, 0.8–1 × 1.5–2 mm; spur 3.8–4.2 mm long and longitudinal septum, with triangular tongue callus at base of mid lobe, erect, obtuse bilobed. Column slender, 2–2.3 mm long; rostellum beak 1.8–2 mm long, strongly twisted sideways through about 90 degrees counterclockwise. Anther *c.* 1 × 1 mm with long beak. Fruit not seen.

*Flowering & fruiting:* Flowering in February; fruit not seen.

*Habitat:* Epiphyte on trees in open forests, at 900 m elevation.

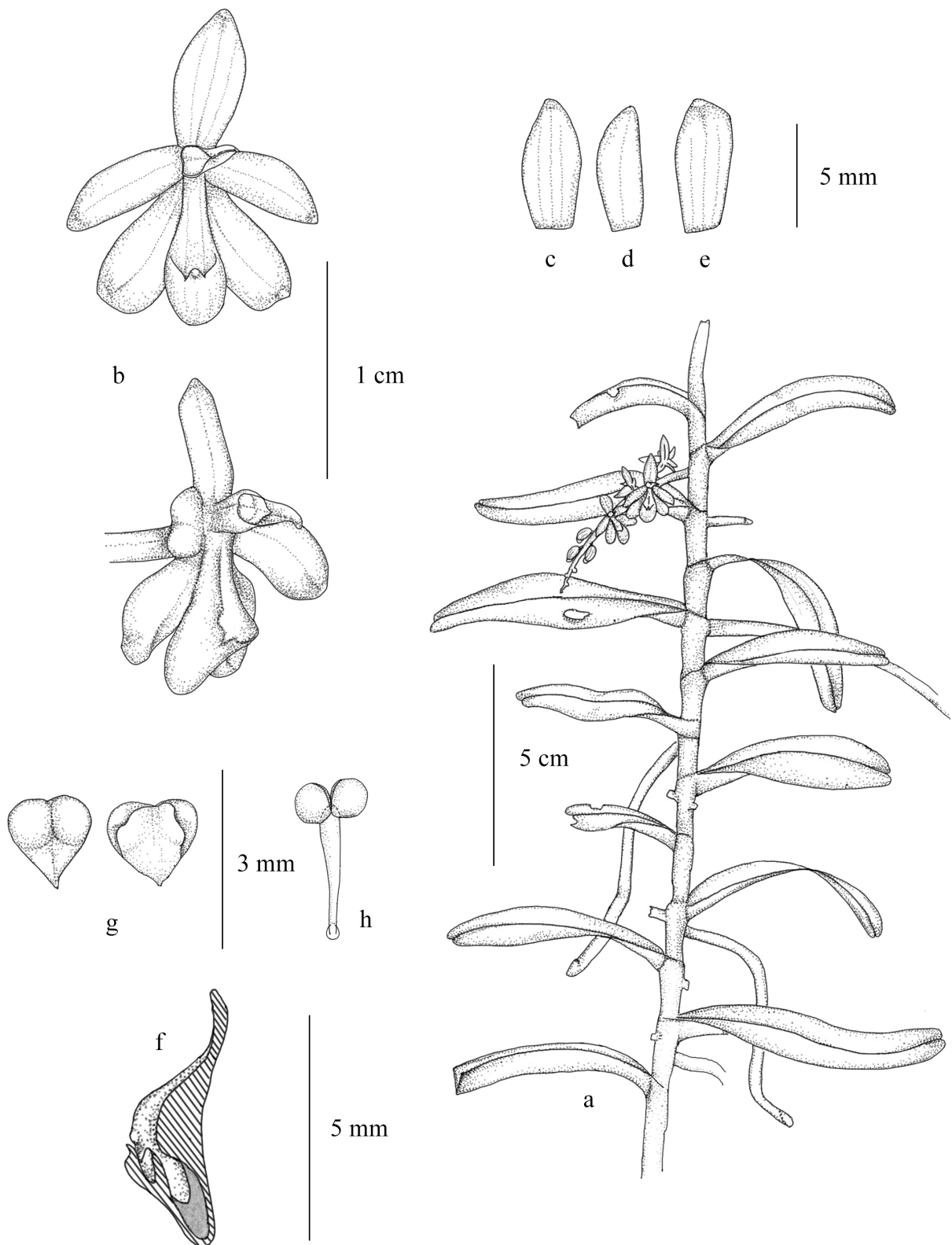
*Distribution:* India (East Himalaya), Bangladesh, Nepal, Myanmar, and Thailand.

*Specimens examined:* THAILAND, **Phang-nga**, Khao Bangto, *c.* 900 m, 23.02.1919, *A.F.G. Kerr s.n.* (AAU, C, K); *s. loc.*, *Lecoulle* 21177 (C).

*Notes:* There are a few specimens of this species from Thailand. Seidenfaden (1988) cited only a collection by Kerr. It is similar to *M. thailandica* but its rostellum is strongly twisted.

**Micropera pallida** (Roxb.) Lindl., *Edwards's Bot. Reg.* 18: t. 1522. 1832; Seidenf., *Opera Bot.* 95: 120. f. 71, 1988; Seidenf. & Wood, *Orchids Penins. Malaysia Singapore*: 617. 1992; Kumar *et al.*, *J. Threatened Taxa* 8: 9416. *Aerides pallida* Roxb., *Fl. Ind.* 3: 475. 1832 [as '*pallidum*']. *Camarotis pallida* (Roxb.) Lindl., *J. Proc. Linn. Soc., Bot.* 3: 37. 1859; Kerr, *J. Siam Soc., Nat. Hist. Suppl.* 9: 238. 1933. *Sarcochilus roxburghii* Hook.f., *Fl. Brit. India* 6: 36. 1894. *Type:* INDIA, eastern parts of **West Bengal**, or **BANGLADESH**, **Chittagong**, *Icon. Aerides pallidum [sic]*, *Roxburgh* 2349 [origin unknown] (syn CAL, K digital image!).

*Camarotis apiculata* Rchb.f., *Bonplandia* 5: 39. 1857; Smith, *Natuurk. Tijdschr. Ned.-Indië* 72: 79–115. 1912; *Bull. Jard. Bot. Buitenzorg.* 3. s. 11:



**Fig. 5.** Line drawings of *Micropera obtusa* (Lindl.) Tang & F.T.Wang: a. Plant; b. Flower–front and oblique top views; c. Dorsal sepal; d. Petal; e. Lateral sepal; f. Section through labellum–side view; g. Operculum– top and below views; h. Pollinarium (from *T. Chanokkhun* 652; drawn by Thotsaporn Chanokkhun).



83–160. 1931; Feddes Repert. Spec. Nov. Regni Veg. Beih. 32: 129–386. 1933; Carr, Gard. Bull. Singapore 7: 54. 1932; Masam., Enum. Phanerog. Born.: 137. 1942; Holttum, Orchid. Malaya: 633, f. 187 c–h. 1957; Seidenf. & Smitinand, Orchids Thailand: 708, f. 527. 1965; Backer & Bakh.f., Fl. Java (Spermatoph.) 3: 440. 1968; Kerr, Nat. Hist. Bull. Siam Soc. 23, 1–2: 185–211. 1969; Seidenf., Bull. Mus. Hist. Nat. (Paris): 112. 1973. *Micropera apiculata* (Rchb.f.) Garay, Bot. Mus. Leaflet 23: 186. 1972. *Sarcanthus apiculatus* (Rchb.f.) J.J.Sm., Orch. Java: 598. 1905. *Dendrocolla apiculata* Zoll. & Mor., Bonplandia 5: 39. 1857, in syn. Type: INDONESIA, Java, Paradana, 06.06.1843, Zollinger 1359 (syn W, Herb. Reichenbach 48556, n.v.), C!, P [P00362565, P00362566 digital images!].

*Camarotis cochinchinensis* Rchb.f., Gard. Chron., n.s. 6: 740. 1876. *Sarcophilus cochinchinensis* (Rchb.f.) G.Nicholson, Ill. Dict. Gard. 3: 360. 1886. Type: VIETNAM, cult., Laurence s.n. (holo W, herb. Reichenbach 48559, n.v.).

*Saccolabium saxicola* Ridl., Trans. Linn. Soc. London 3: 374. 1893 [as '*saxicolum*']. Type: PENINSULAR MALAYSIA, Kota Glanggi, Ridley s.n. (holo SING, n.v.).

*Sarcanthus thorelii* Guillaumin, Bull. Soc. Bot. France 77: 331. 1930. Type: THAILAND, Godefroy 633 (syn P [P00361136 digital image!]); CAMBODIA, Angkor Thom, Harmand s.n. (syn P [P00361138 digital image!]); Prea Can, Harmand s.n. (syn P?, n.v.); VIETNAM, C. Thorel 159 (syn P [P00361141 digital image!]).

Figs. 2e & 6

Stem up to 30 cm long, glabrous, covered by smooth leaf sheaths; roots arising along stem. Leaves distichous, c. 2 cm apart, flat, conduplicate, oblong-linear, 8–15 × 1–1.5 cm, apex equally to unequally bilobed with rounded lobes, fleshy. Inflorescences pendent, 5–8 cm long, several-flowered; peduncle 5–10 cm long, with 2–3 sheathing peduncle scales 1.5–2 mm long; rachis 5–8 cm or more long, unbranched; bracts broadly triangular, obtuse, c. 2.5 × 2.5 mm. Flowers non resupinate, yellow, labellum yellow, sepals yellow, sometimes tipped with purple midline on back, column white or cream; pedicel and ovary terete with longitudinal grooves, 1–1.2 mm long. Dorsal sepal elliptic-ovate, 6–6.5 × 2–2.5 mm, apex broadly rounded; 5-veined; lateral sepals broadly elliptic, 6–6.3 × 2.3–

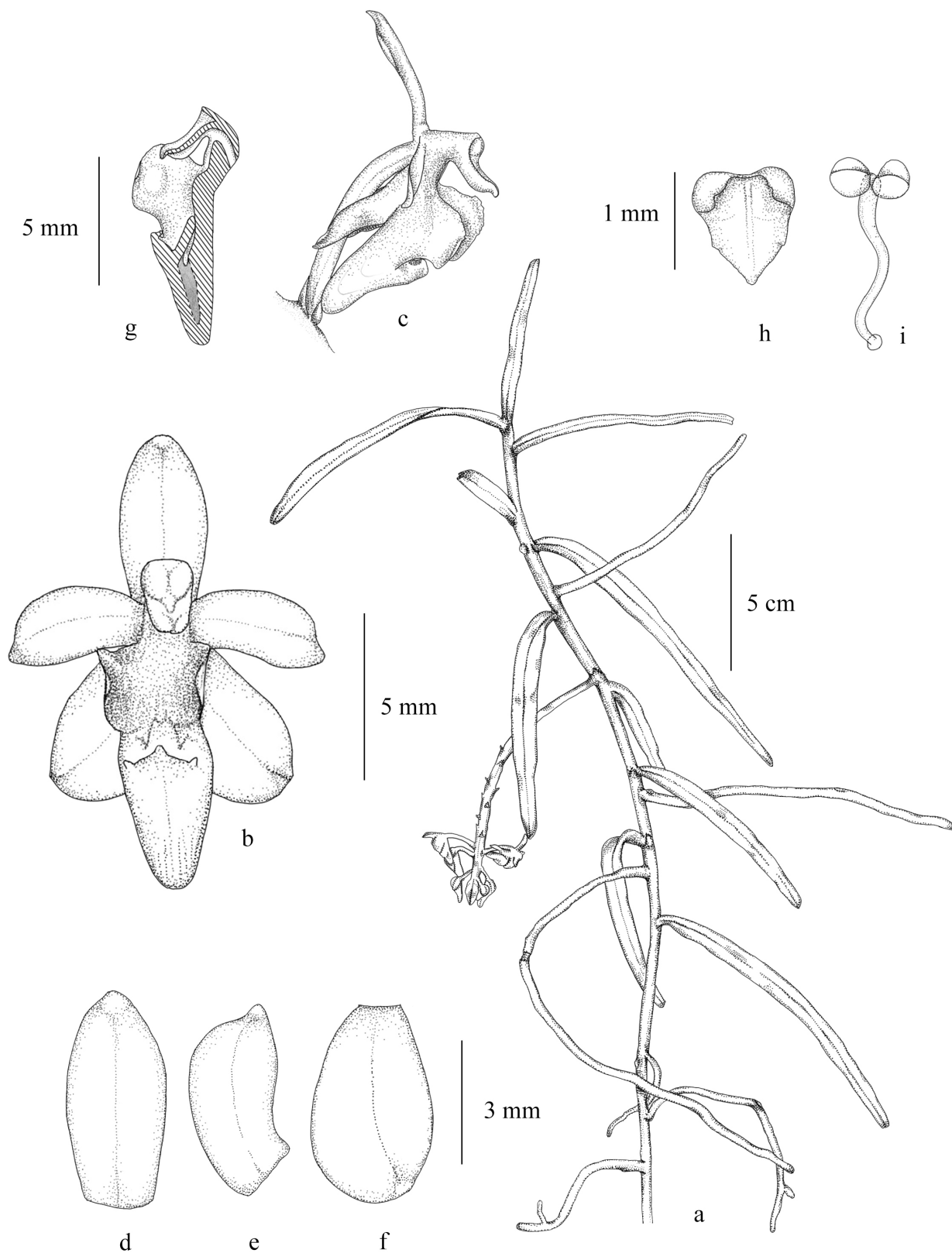
2.6 mm, 5-veined. Petals elliptic-lanceolate, 5–5.5 × 2–2.5 mm, acute; 3-veined. Labellum fleshy, chin-shaped, 3–4 mm long, 8–9 mm high; lateral lobes conspicuous, quadrangular, 4–4.5 × 2–2.2 mm; mid-lobe triangular, 3–3.2 × 3.2–3.5 mm; spur 4.5–5 mm long, with longitudinal septum and triangular callus at base of mid lobe, split at end; back wall of spur with obscure callus; spur with longitudinal septum. Column 2–3 mm long; rostellum beak c. 2 mm long, not twisted. Anther c. 2.3 mm long, with long beak. Fruit terete, 5–6 × 0.5–0.7 cm long.

*Flowering & fruiting*: Flowering during July–October; fruiting during October.

*Habitat*: Epiphyte in evergreen forests.

*Distribution*: India, Bangladesh, Laos, Myanmar, Thailand, Laos, Cambodia, Vietnam, Malaysia, Indonesia.

*Specimens examined*: THAILAND, **Chaiyaphum**, Between Nam Prom and Tunkamang, Geesink 6909 (C); *Ibid.*, 24.03.1980, G. Seidenfaden & T. Smitinand 8822 (C); Phu Khieo, 19.02.1977, N. Jacobsen 48 (C); Dat Don, 300–400 m, 24.03.1973, K. Larsen, S.S. Larsen, I. Nielsen & T. Santisuk 31789 (AAU). **Chantaburi**, Ban Thakien Thong W of Soi Dao, 50–75 m, 23.03.1973, K. Larsen, S.S. Larsen, I. Nielsen & T. Santisuk 32239 (AAU). Road from Chantaburi to Trat, 16.11.1969, C. F. van Beusekom & T. Smitinand 2239 (AAU, BKF); *Ibid.*, 23.03.1973, K. Larsen, S. S. Larsen, I. Nielsen & T. Santisuk 32400 (AAU, BKF). **Chiang Mai**, Doi Suthep, 03.1959, G. Seidenfaden & T. Smitinand 3507 (C). **Kamphaeng Phet**, 25.05.1912, A.F.G. Kerr 308 (K). **Kanchanaburi**, near Wangka, 150 m, 24.05.1946, A. Kostermans 722 (C, K); Saiyok, T. Smitinand 7436 (C); Sangklaburi, Chedi Sam Ong Market, 14.08.2011, J. Phelps 436 (BKF). **Nakhon Si Thammarat**, Khao Chem, Tungsong, Rabil 125 (C). **Narathiwat**, Su-ngai Padi, Paa Wai, 10.02.1988, C. Niyomdham 1666 (BKF); Su-ngai Padi, 28.07.2006, V. Rattanabunno 20 (BKF); Tak Bai, 22.07.1988, C. Niyomdham 1898 (K). **Pathum Thani**, Phra Tam Nak Suan Pathum, 16.06.2004, S. Suddee et al. 2023 (BKF). **Phetchabun**, Nam Nao National Park, 21.02.1977, N. Jacobsen 72 (C). **Phetchaburi**, Kaeng Krachan, Mae Pradon River, 110 m, 23.08.2002, D.J. Middleton et al. 951 (BKF); Kaeng Krachan National Park, 27.08.2004, I. Nielson et al. 1932 (BKF); *Ibid.*, 290 m, 10.05.2005,



**Fig. 6.** Line drawings of *Micropera pallida* (Roxb.) Lindl.: a. Plant; b. Flower–front view; c. Flower–side view; d. Dorsal sepal; e. Petal; f. Lateral sepal; g. Section through labellum–side view; h. Operculum–below view; i. Pollinarium (from *T. Chanokkhun* 596; drawn by Thotsaporn Chanokkhun).

D.J. Middleton, C. Hemrat, S. Lindsay, S. Suddee & S. Suwanachat 3345 (BKF); *Ibid.*, 15.01.2008, S. Raksue 03 (BKF); *Ibid.*, 403 m, 08.04.2010, N. Toolmal & W. Somprasong (BKF); Krabue, Sagarik s.n. (C). **Phitsanulok**, Lomsak road at km 80, 09.02.1964, G. Seidenfaden & T. Smitinand 5362 (C); N of Thung Salaeng Luang, G. Seidenfaden & T. Smitinand 5388; Thung Salaeng Luang, G. Seidenfaden & T. Smitinand 5365 (C); Thung Salaeng Luang National Park, 750–800 m, 18.05.2007, O. Phueakhlai, P. Tippayasri & N. Anuraktragoon 20 (BKF). **Prachuap Khiri Khan**, Pranburi, Ban Tak Tawan, 30.07.1931, Marcan 2700 (C); Sam Roi Yot, 50 m, 08.07.1914, A.F.G. Kerr 329 (K). **Songkhla**, Hat Yai Nai, 09.07.1985, J.F. Naxwell 85–699 (BKF). **Surat Thani**, Bangbao, 14.10.1960, G. Seidenfaden & T. Smitinand 529 (C); *Ibid.*, 07.08.1971, G. Seidenfaden & T. Smitinand 627 (C); W of Bangto, Huay Ai Chuang, 16.06.1970, G. Seidenfaden & T. Smitinand 7614 (C). **Trat**, between Khlung & Trat, 20 m, 12.06.1972, T. Smitinand 1160 (BKF); Koh Chang, 11.08.1960, G. Seidenfaden & T. Smitinand 3651 (C). **Uthai Thani**, Huay Nam Wing, Banrai, 27.03.1980, Kasem 308 (C); s. loc., T. Smitinand s. n. (C). **Yala**, Khao Pok Yok near Banang Sata, 500–600 m, 29.11.1990, K. Larsen, S. S. Larsen, A.S. Barfod, W. Nanakorn, W. Ueachirakan & P. Sirirugsa 41819 (AAU); Betong, Ban Chantharat, N 5° 47'N, E 101° 10', 230 m, 23.07.2007, J. Wai 1058 (PSU!); *Ibid.*, 14.08.2011, J. Wai 2090 (PSU). CAMBODIA, **Angkor Thom**, Preacan, *Egerod* 373 (C!). MYANMAR, **Tenasserim**, A.F.G. Kerr 01000 (C). INDONESIA, **Java**, Paradana, Zollinger 1359 (C). MALAYSIA, **Selangor**, Klang, Nur s.n. (C). LAOS, **Vientiane Plain**, A.D. Kerr 1941 (C); Muang Baw, c. 200 m, 27.04.1932, A.F.G. Kerr 987 (K).

Note: This common species can be identified by the large side lobes of the labellum and the straight spur.

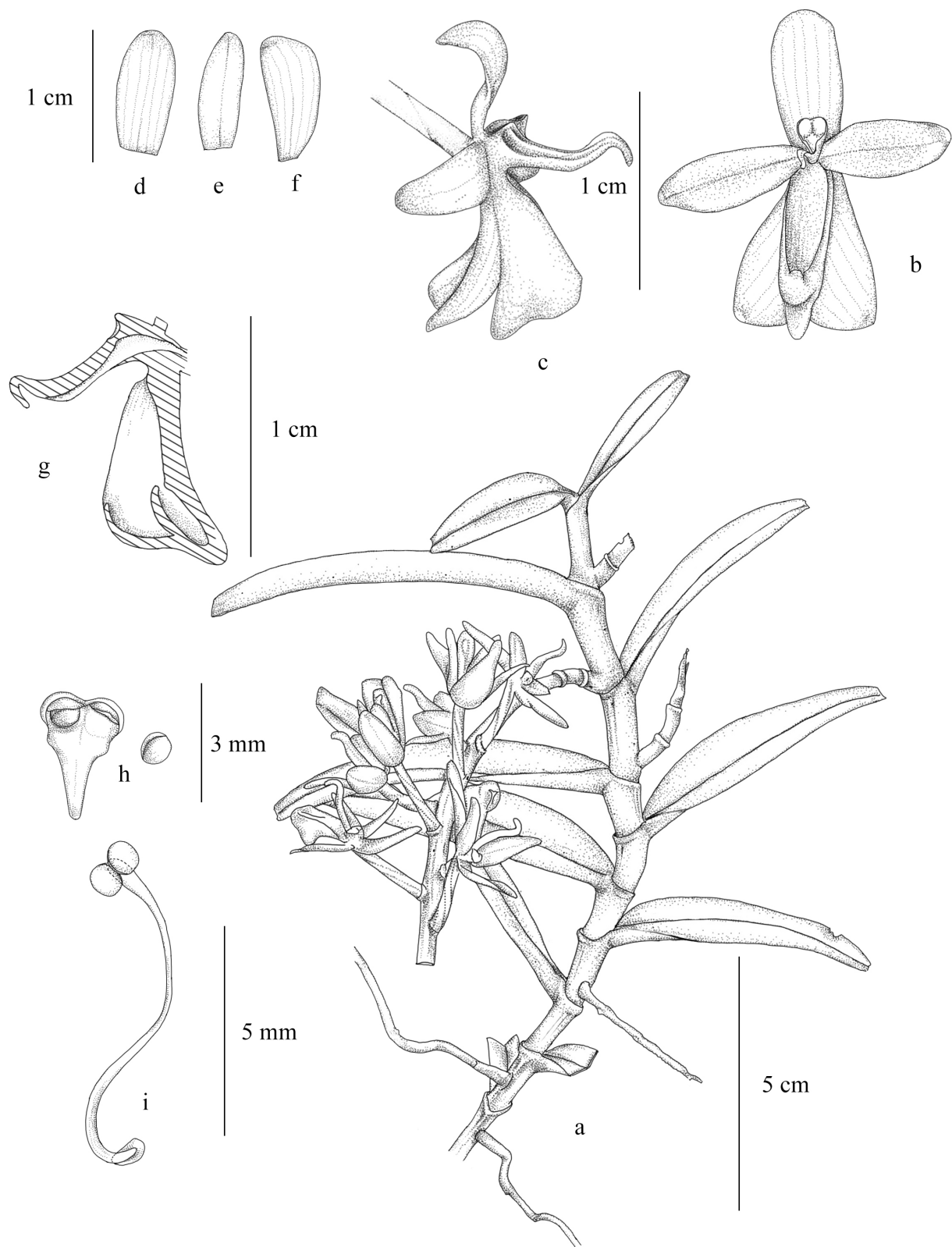
**Micropera rostrata** (Roxb.) N.P. Balakr., J. Bombay Nat. Hist. Soc. 67: 66. 1970; **Seidenf.**, Nordic J. Bot. 2: 217. 1982; Christenson, Amer. Orchid Soc. Bull. 54, 8: 956. 1985. *Aerides rostrata* Roxb., Fl. Ind. 3: 474. 1832 [as '*rostratum*']. *Camarotis rostrata* (Roxb.) Rchb.f. in **Walp.**, Ann. Bot. Syst. 6: 881. 1861; Prain, Bengal Pl. 2: 1204. 1903; Hunt., Bot. Mag. 177: 537. 1969. *Type*: BANGLADESH, **Sylhet**, icon. *Aerides rostratum* [sic], Roxburgh 2348 (syn CAL, K digital image!).

*Micropera purpurea* (Lindl.) Pradhan, Indian Orchids 2: 619. 1979. *Camarotis purpurea* Lindl., Gen. Sp. Orchid. Pl. 219. 1833; Sert. Orchid. 19. 1838; Paxt. Mag. Bot. 7: 25. 1840; J. Linn. Soc., Bot. 3: 37. 1859; Smith, Natuurk. Tijdschr. Ned.-Indië 72: 98. 1912; Schltr., Orchideen: 589. 1915; 580. 1927; Fischer, Rec. Bot. Surv. India 12, 2: 136. 1938; Seidenf. & Smitinand, Orchids Thailand: 715, f. 522. 1965; Rao & Deori, J. Ind. For. 3, 3–4: 258. 1980. *Sarcochilus purpureus* (Lindl.) Benth. ex Hook.f., Fl. Brit. India 6: 37. 1890; Panigrahi & Naik, Bull. Bot. Surv. India 3, 3–4: 381. 1962. *Lectotype* (designated here): BANGLADESH, **Sylhet**, Purarook, March 1828, *Wallich* 7329 (leg. W. Gomez 185) (K-LINDL [K000974248!], isolecto K-W [K001127183!]). **Figs. 2f-g & 7**

Stem 12–20 cm long, covered by glabrous leaf sheaths. Leaves about 10, distichous, c. 2 cm apart, flat, conduplicate, oblong-linear, 10–12 × 1.5–2 cm, apex unequally bilobed with rounded lobes, fleshy. Inflorescences pendent, 10–15 cm long, up to 30-flowered; peduncle 3–5 cm long, with 2–3 sheathing sterile bracts 0.3–0.4 cm long; rachis up to 30 cm long, unbranched; bracts broadly triangular, obtuse, 2–2.5 × c. 2 mm, fleshy. Flowers non resupinate, pale to bright purple-pink, lip base sometimes white with purple-pink margin, column white tinged with purple-pink; pedicel and ovary 9–12 cm long. Dorsal sepal elliptic-oblong, 8–10 × 4–4.5 mm, apex broadly rounded or obtuse and usually recurved, 5-veined; lateral sepals obovate-oblong, falcate, 8.3–9.5 × 3.8–4.2 mm, apex broadly rounded, 5-veined. Petals elliptic-oblong or lanceolate-oblong, to 8.2–9 × 3.4–3.5 mm, slightly oblique, broadly rounded, 5-veined. Labellum fleshy, deeply boat-shaped, 8–8.5 mm long, 5.4–6.3 mm high, obscurely 3-lobed; lateral lobes inconspicuous, broadly triangular, 7–7.5 × 1–2 mm; mid-lobe triangular, 0.5–0.6 × 1–1.3 mm; spur 4.8–5.7 mm long, with longitudinal septum and triangular tongue callus at base of mid lobe. Column stout, 1.8–2 mm long; rostellum beak 6.5–7 mm long, sigmoid in lateral view, only slightly twisted sideways. Anther c. 3 × 1 mm long with long beak. Fruit not seen.

*Flowering & fruiting*: Flowering from May to July and in December; fruit not seen.

*Habitat*: Epiphyte in evergreen hill forests, at 1,300–1,600 m elevation.



**Fig. 7.** Line drawings of *Micropera rostrata* (Roxb.) N.P.Balakr.: a. Plant; b. Flower—front view; c. Flower—side view; d. Dorsal sepal; e. Petal; f. Lateral sepal; g. Section through labellum—side view; h. Operculum—below view; i. Pollinarium (from *T. Chanokkhun* 651; drawn by Thotsaporn Chanokkhun).

*Distribution:* India, Bangladesh, and Thailand.

*Specimens examined:* BANGLADESH, **Sylhet**, 12.12.1997, *Wallich* 7329 (K-W digital image); INDIA, **Assam**, Jaintiapur, Jaintea Hills, April 1899, *Prain* 111 (M digital image). THAILAND, **Loei**, Phu Krading, 1300 m, 07.1959, *G. Seidenfaden & T. Smitinand* 3730 (C). **Mae Hong Son**, Ban Rak Thai, c. 1600 m, 12.06.2020, *A. Karnpungton s.n.* (QBG). **Tak**, Mae Sot, 21.05.1988, *W. Songkakul* 17 (BKF).

*Notes:* This species is easily recognised by the very long and sigmoid rostellum. With its numerous, bright pinkish-purple flowers it is one of the more attractive species in this genus, which is generally of little horticultural importance.

**Micropera thailandica** Garay ex Seidenf., *Opera Bot.* 95: 126. 1988; Vaddhanaphuti, *Wild Orchid Thailand*, ed. 4, 186, incl. colour photo, 2005; Schuiteman *et al.*, *Cambodian J. Nat. Hist.* 2015 (2): 136, f. 6 & 7. 2015; Kurzweil & Lwin, *Gard. Bull. Singapore* 67(1): 117, f. 1B & 3C. 2015. *M. thailandica* (Seidenf. & Smitinand) Garay, *Bot. Mus. Leafl.* 23: 187. 1972, *nom. inval.* *Camarotis thailandica* Seidenf. & Smitinand, *Orchids Thailand*: 712, f. 529. 1965, *nom. inval.*; Cumberlege., *Nat. Hist. Bull. Siam Soc.* 20, 3: 155–174. 1963. *Type:* THAILAND, **Satun**, Feb 1961, *Seidenfaden, G. & Smitinand, T. GT* 4118 (holo C). **Figs. 2h-i & 8**

Stem up to 30 cm long, glabrous, covered by dark, rugose leaf-sheaths. Leaves distichous, c. 2 cm apart, flat, conduplicate, oblong-linear, 8–18 × 1–1.5 cm, apex unequally bilobed with subacute lobes, fleshy. Inflorescences more or less upright, 8–15 cm long, with up to 25 flowers; peduncle 7–10 cm long, with 2–3 sheathing peduncle scales 3–4 mm long; rachis 5–10 cm long, unbranched; bracts broadly triangular, obtuse, 1.5–2 × 2.5–3 mm. Flowers non resupinate, yellow or light orange-yellow, lip base sometimes white, sepals sometimes tipped with brown, column white or cream. Dorsal sepal elliptic-ovate, 7–7.5 × 2.5–3 mm, apex broadly rounded, concave, fleshy; lateral sepals ovate-oblong 6.5–7 × 3.5–4 mm, slightly oblique. Petals elliptic-lanceolate, 6.5–7 × 2–2.5 mm, obtuse. Labellum fleshy, deeply boat-shaped 6–6.5 mm long, 5.5–6 mm high, obscurely 3-lobed; lateral lobes inconspicuous, broadly triangular 5–5.5 × 1.2–1.5 mm, edges minutely serrate; mid-lobe triangular, 1.5–2 × 2–2.5 mm, with indistinct

cone-shaped swelling; spur 5–6.5 mm long, with longitudinal septum and triangular tongue-shaped callus at base of mid lobe, emarginate. Column slender, 5–6 mm long, with 2 short appendages below stigma; rostellum beak 1.5–2 mm long, not twisted. Anther 1.8–2 × 1.5–1.6 mm, with short beak. Fruit not seen.

*Flowering & fruiting:* Flowering in April–May; fruit not seen.

*Habitat:* Epiphyte in evergreen forests.

*Distribution:* Myanmar, Thailand, Cambodia, and Vietnam.

*Specimens examined:* THAILAND, **Bangkok**, Jatujak Market, 18.04.2012, *J. Phelps* 7680 (BKF). **Loei**, Phu Pha Mok, 06.04.2003, *D.J. Middleton et al.* 1935 (BKF). **Nakhon Nayok**, Haew Suwat, Khao Yai, 23.04.1964, *G. Seidenfaden & T. Smitinand* 5773 (C). **Nakhon Ratchasima**, Khao Yai, 700 m, *G. Seidenfaden & T. Smitinand* 4403 (C), Khao Yai National Park, Pha Khuai Mai Nature Trail, 747 m, 08.04.2019, *S. Kaitongsuk* 211 (BKF). **Narathiwat**, Weang, *P. Puudjaa* 321 (BKF). **Phthalung**, Khao Den, c. 200 m, 19.04.1928., *A.F.G. Kerr* 0574 (K); Khao Soidao, c. 600 m, 29.04.1930, *A.F.G. Kerr* 0835 (K). **Ranong**, NW of Phato, 200–300 m, 02.05.1974, *K. Larsen & S.S. Larsen* 33557 (AAU!). **Rayong**, *s. loc.*, 11.04.2004, *P. Puudjaa* 1322 (BKF). **Satun**, Khao Keo Range, 700 m, 31.03.1963, *A.F.G. Kerr* 0528 (AAU); Thungnui, 05.02.1961, *G. Seidenfaden & T. Smitinand* 4118 (C).

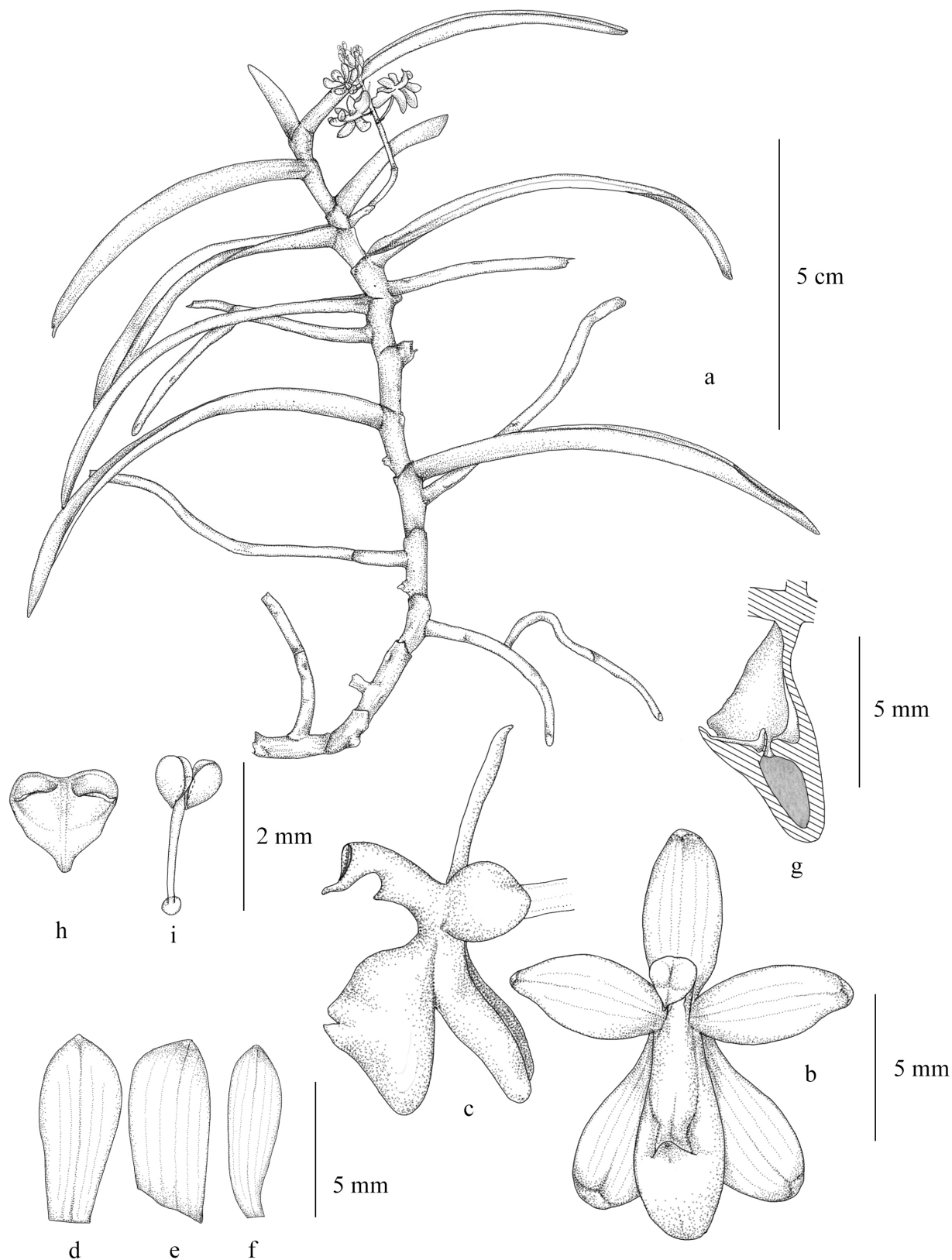
*Notes:* This species is similar to *M. fuscolutea* (Lindl.) Garay but differs in lacking a distinct, raised callus on the labellum mid-lobe.

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**Fig. 8.** Line drawings of *Micropera thailandica* Garay ex Seidenf.: a. Plant; b. Flower—front view; c. Flower—side view; d. Dorsal sepal; e. Petal; f. Lateral sepal; g. Section through labellum—side view; h. Operculum—below view; i. Pollinarium (from T. Chanokkhun 653; drawn by Thotsaporn Chanokkhun).

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