

**CONTRIBUTIONS TO THE TAXONOMIC
REVISION OF THE GENUS *CREPIDIUM*
(*ORCHIDACEAE*–*MALAXIDINAE*): THE NEW
SUBSECTION *MAXIMOWICZIANAE*
(SECTION *HOLOLOBUS*)**

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This is the first part of a taxonomic revision of section *Hololobus* of the paleotropical orchid genus *Crepidium* (*Orchidaceae*–*Malaxidinae*). Based on morphology and habit, the new subsection *Maximowiczianae* is established to include six species from India, Malaysia, Indonesia and the Philippines. The new combination *Crepidium carinatum* is published with *C. benguetense* as a synonym. A key is provided, and all species are described and illustrated.

Keywords. *Crepidium*, *Fingardia*, section *Hololobus*, *Malaxidinae*, *Malaxis*, subsection *Maximowiczianae*, *Orchidaceae*, taxonomy.

INTRODUCTION

In 1995 Szlachetko included 167 species in the genus *Crepidium* Blume emend. Szlach. (*Orchidaceae*–*Malaxidinae*). Nowadays, the genus contains over 250 species, occurring in SE Asia, Australia and the Pacific Islands. Szlachetko (1995) recognized two sections: *Crepidium* and *Commelinoides* (Schltr.) Szlach. According to the original diagnoses (Blume, 1825; Schlechter, 1914), the flowers in both sections are characterized by lips with distinctly toothed distal margins. However, the lips of many species of *Crepidium* are distally untoothed, with the mid-lobe either entire or divided in two small lobes at the apex. Many of these species were previously included in section *Hololobus* Schltr. of *Microstylis* (Nutt.) Eaton (Schlechter, 1914) and later in *Malaxis* Sol. ex Sw. I have recently transferred section *Hololobus* (Schltr.) Marg. to *Crepidium* (Margońska, 2005).

While revising the genus I examined herbarium specimens and spirit collections, and consulted original images and references. Among the c.80 species in section *Hololobus*, six show the following characters: lip \pm triangular to cordate, mid-lobe entire at apex, not clearly separate from lateral lobes; auricles of lateral lobes short, occasionally slightly longer than lip base. These features clearly distinguish these species from others in the section. Therefore I propose to place them in the new subsection *Maximowiczianae* Marg.

TAXONOMY

Crepidium Blume, Bijdr.: 387 (1825) emend. Szlach., Fragm. Flor. Geobot., Suppl. 3: 123 (1995).

Section *Hololobus* (Schltr.) Marg., Candollea 60(2): 374 (2005).

Syn.: *Microstylis* sect. *Hololobus* Schltr., Repert. Spec. Nov. Regni Veg., Beih. 1: 124 (1911) 1914; *Malaxis* sect. *Hololobus* (Schltr.) K.Hill & D.F.Blaxell, Orchadian 8(4): 80 (1985). Type: *Microstylis nitida* Schltr. (syn. of *Crepidium nitidum* (Schltr.) Szlach.).

Subsection **Maximowiczianae** Marg., **subject. nov.**

Syn.: *Fingardia* Szlach. p.p.

Rhizoma abbreviatum strictum, caulibus paucis confertis, pseudobulbis distinctis subcarnosis, squamis et basibus foliorum obtectis, foliis in pars apicali pseudobulbi positus. Labellum plus minusve triangulare vel cordatum, lobo centrali non divulso, apice integro in loba lateralia gradatim descrescenti, auriculis loborum lateraliu distinctissime abbreviatis, interdum post basin labelli parum extensis.

Rhizome strongly abbreviated; shoots few in cluster; pseudobulbs relatively fleshy, erect, enclosed in basal scales and leaf bases; leaves borne in apical part of pseudobulb. Lip \pm triangular to cordate; mid-lobe entire, merging into lateral lobes; auricles of lateral lobes reduced, occasionally exceeding lip base.

Type species: *Crepidium maximowiczianum* (King & Pantl.) Szlach.

Based on floral morphology, particularly lip shape, the species in section *Maximowiczianae* refer superficially to the genus *Fingardia* Szlach. (Szlachetko, 1995). However, five of the 10 species in *Fingardia* had distinctly toothed distal margins to the lip lateral lobes: *F. latolabris* (Schltr.) Szlach., *F. lokonensis* (Schltr.) Szlach., *F. nephroglossa* (Schltr.) Szlach., *F. yamapensis* Marg., Szlach. & Rutk., and the wrongly placed *F. lunata* (Schltr.) Szlach., which has well-developed auricles on the lateral lobes. All of the species with dentate lips I now treat in sections *Crepidium* or *Commelinoides* (Schltr.) Szlach., according to habit. *Fingardia alagensis* (Ames) Szlach., considering its entire lip margins and well-developed auricles of lateral lobes, I place in section *Hololobus* s.l.

Although the main criterion distinguishing subsection *Maximowiczianae* is the morphology of the lip, all its members are also characterized by the following growth habit: abbreviated rhizome (plants commonly clustered); erect, noded, somewhat fleshy, fusiform pseudobulbs, usually completely covered by leaf bases and basal scales; leaves in apical part of pseudobulb; gynostemium usually rather large for the genus.

Information on pollinators is scarce and uncertain, but small insects such as Hymenoptera or Diptera are likely to be involved.

As this subsection is poorly represented in herbaria and spirit collections, drawings of type specimens and detailed descriptions taken from all specimens consulted

have been provided. These should prove helpful in establishing the variability within each species and clarify the morphological differences between taxa.

Key to the species of Crepidium sect. Hololobus subsect. Maximowiczianae

- 1a. Petals narrow, \pm ensiform, auricles of lip lateral lobes divergent, laterally directed _____ 2
- 1b. Petals oblanceolate to obovate, auricles of lip lateral lobes \pm parallel, pendent _____ 4
- 2a. Lip with large, distinct \pm horseshoe-shaped thickening covering apical part of central cavity _____ **1. *C. carinatum***
- 2b. Lip without such a thickening over central cavity _____ 3
- 3a. Lip spreading, distal margins wavy; central cavity with thick marginal rim _____ **2. *C. carrii***
- 3b. Lip deeply hood-shaped, distal margins recurved, entire; central cavity with thin marginal rim _____ **5. *C. maximowiczianum***
- 4a. Petals narrowly obovate; auricles of lip lateral lobes rounded; central cavity oblong, at apex concealed by lunate crease _____ **3. *C. cordiglottis***
- 4b. Petals narrowly oblanceolate; auricles of lip lateral lobes obtuse to acute; central cavity lanceolate, not concealed _____ 5
- 5a. Sepals c.2 \times longer than wide; lip relatively small (<c.1.8mm long), at least slightly longer than wide _____ **4. *C. kobi***
- 5b. Sepals c.1.5 \times longer than wide; lip relatively large (>2.2mm long), at least slightly wider than long, with small, oblong concavities either side of base of central cavity _____ **6. *C. tenggerense***

1. *Crepidium carinatum* (Rchb.f.) Marg., comb. nov. Fig. 1.

Basionym: *Dienia carinata* Rchb.f., Bonplandia 3: 223 (1855). Type: Philippines, Boholo Island, *Cuming* 2144 (holo. W-R 40924!).

Syn.: *Microstylis carinata* (Rchb.f.) Rchb.f., Walp. Ann. 6: 207 (1861).

Malaxis carinata (Rchb.f.) Kuntze, Rev. Gen.: 673 (1891).

Malaxis benguetensis Ames, Phil. J. Sci., Bot. 6: 43–44 (1911).

Dienia benguetense (Ames) M.A.Clem. & D.L.Jones, Lasianthera 1: 41 (1996).

Crepidium benguetense (Ames) Marg., Ann. Fen. Bot. 39: 65 (2001).

Plant 10–22cm tall, sometimes few clustered. Roots 3–9cm, borne on base of pseudobulb and nodes of rhizome. Rhizomes c.1–3cm long, sometimes branched. Pseudobulbs 1.7–5 \times 0.4–0.9cm, few-noded, green; basal scales few, elongated, tubular, inflated, acuminate to acute at apex. *Leaves* 3–4; sheath 1.2–2.5 \times 0.4–0.9cm, yellower than petiole, sometimes with purplish tint; petiole 0.5–1.2 \times 0.6–0.9cm (when spread), paler green than blade; blade 2.8–9 \times 1.2–7.2cm, oblique, ovate to

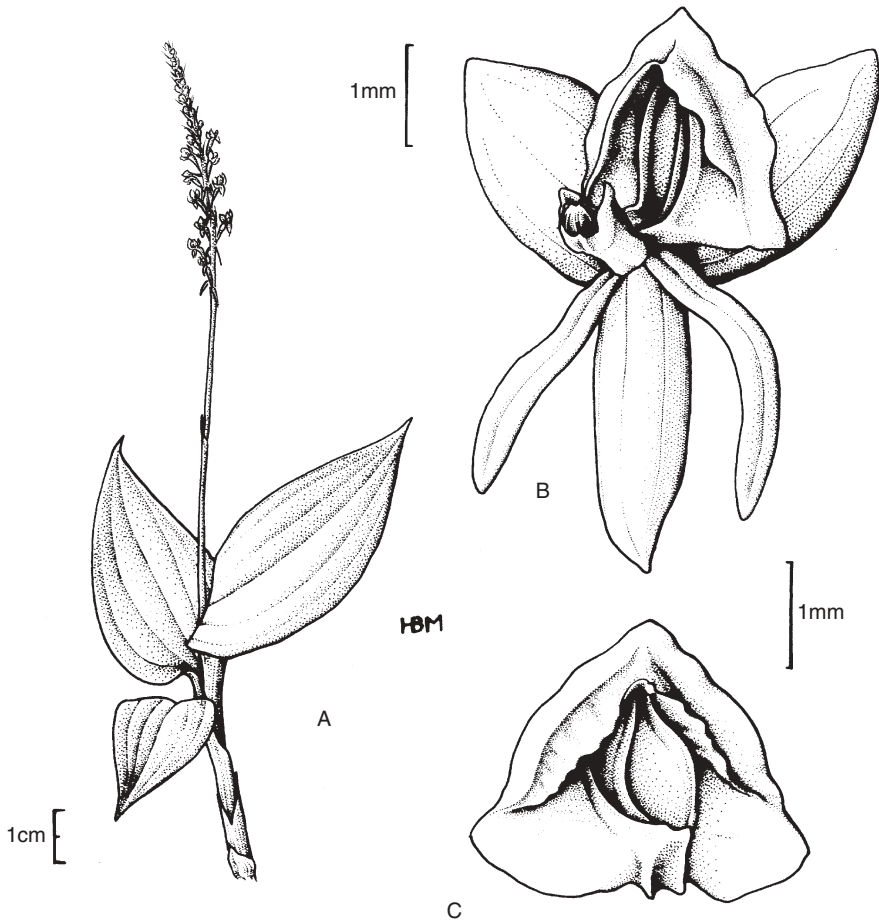


FIG. 1. *Crepidium carinatum* (Rehb.f.) Marg.: A, upper part of plant; B, flower; C, lip. (Cuming 2144, holotype.)

oblong-ovate, distinctly acuminate, with c.3–5 veins, green, sometimes with purplish tint beneath. *Inflorescence* 8–15cm long; raceme 3–7.5cm long, 10–40-flowered, cylindrical, dense; peduncle 5–7.5 × 1.2–1.6mm, narrowly winged. Sterile bract 1.5–7mm long, erect or slightly recurved from stem. Floral bracts 3.5–7 × 0.7–1.1mm, linear to lanceolate, attenuate, acute, 1-veined, longer than pedicel plus ovary in young flowers, recurved. Ovary plus pedicel 2–9mm long. *Flowers* 4.5–6 × 3–4.4mm, fuscous greenish to purplish. Tepals widely spread to recurved, lateral margins slightly revolute. Dorsal sepal 2.5–3 × 1–1.3mm, oblong, obtuse to subacute, 3-veined. Lateral sepals 2–2.4 × 1.3–1.6mm, oblique, elliptic to oblong-elliptic, obtuse to subacute, 3-veined. Petals 2.4–2.7 × 0.6–0.8mm, linear to narrowly lanceolate, falcate, obtuse to acute, 1-veined. Lip 2.4–2.7 × 2.9–3.3mm, variable in outline: heart-shaped or triangular to broadly and bluntly hastate; mid-lobe

triangular, entire, acute, with a distinct, \pm horseshoe-shaped, wavy-edged thickening (0.3–0.5mm high, c.0.1mm wide) on the inner side of the apical margin (0.2–0.3mm from edge), about 1/3–1/2 length of cavity, the thickening merging with outer margin of lateral lobes; basal auricles of lateral lobes slightly longer than lip base, broadly triangular, widely spread, obtuse; middle portion of lip lamina broadly and deeply concave; central cavity 1.1–1.4mm \times 0.8–1.1mm, c.0.2mm deep, broadly ovate, surrounded by thick rim; basal callus oblong, erect, finely retuse at apex; purple. Gynostemium 1.2–1.4 \times 0.7–1mm, purple or greenish; staminodes oblong-ovate, obtuse; anther 0.7–0.8 \times 0.9–1mm. *Fruit* 1–1.2cm long, ovate, yellow to brown.

Ecology. Terrestrial, on humus in forest. Flowering May–June.

Distribution. Philippines (Luzon), Indonesia (Sumatra). c.2100m.

Specimens examined. PHILIPPINES. Luzon, Pampanga Prov., Mt. Pinatubo, Camp Stotsenburg, v 1927, *A.D.E. Elmer* 22239 (BM-000088012, K, US); Benguet Subprov., Pauai, vi 1909, *McGregor* s.n. (type of *Malaxis benguetensis* Ames: AMES, K), Mt. Sant Thomas, v 1918, *G. Boettcher* s.n. (AMES). INDONESIA. Sumatra, W coast, Mount Merapi, W slope, v *Borssum* 2116 (L-959 183-027).

Having compared the types of *Dienia carinata* Rehb.f. (W-R 40924) and *Malaxis benguetensis* Ames (AMES, K) I consider them conspecific. The epithet '*carinata*' has priority.

Sometimes *Malaxis benguetensis* has been mistakenly included in *Dienia* Lindl., probably on account of the small imprecise sketch of the lip on the type specimen. A detailed study of floral morphology, especially the lip, clearly shows features characteristic of *Crepidium*, for example central cavity with only 3 veins and marginal rim.

The plants show a wide range of variation in measurements and there are two colour forms; usually the flowers are purplish, occasionally greenish.

2. *Crepidium carrii* (Seidenf. & J.J.Wood) M.A.Clem. & D.L.Jones, *Lasianthera* 1: 35 (1996). **Fig. 2.**

Syn.: *Malaxis carrii* Seidenf. & J.J.Wood, *Orch. Penn. Mal. and Sing.*: 221 (1992). Type: Malaysia, Pahang State, Gunung Senyum, xi 1929, *C.E. Carr* 228 (holo. K!, illustr. K!; iso. SING-0025823!, C-GS!).

Fingardia carrii (Seidenf. & J.J.Wood) Szlach., *Fragm. Flor. Geobot.*, Suppl. 3: 134 (1995).

Plant 20–28cm tall, few per cluster. Roots 4–13cm, clustered at base of pseudobulb and solitary at rhizome nodes. Rhizome c.1–5cm long. Pseudobulbs 1.5–3(4) \times 0.4–0.6(0.8)cm, fusiform, thicker near base, few-noded; basal scales tubular, acute to acuminate, green. *Leaves* 4–5; sheath (0.8)1–1.5(21) \times 0.5–0.8(1)cm, with yellow to brown tint; petiole (1)1.5–2.5 \times (0.4)0.5–0.7cm, paler green than blade; blade

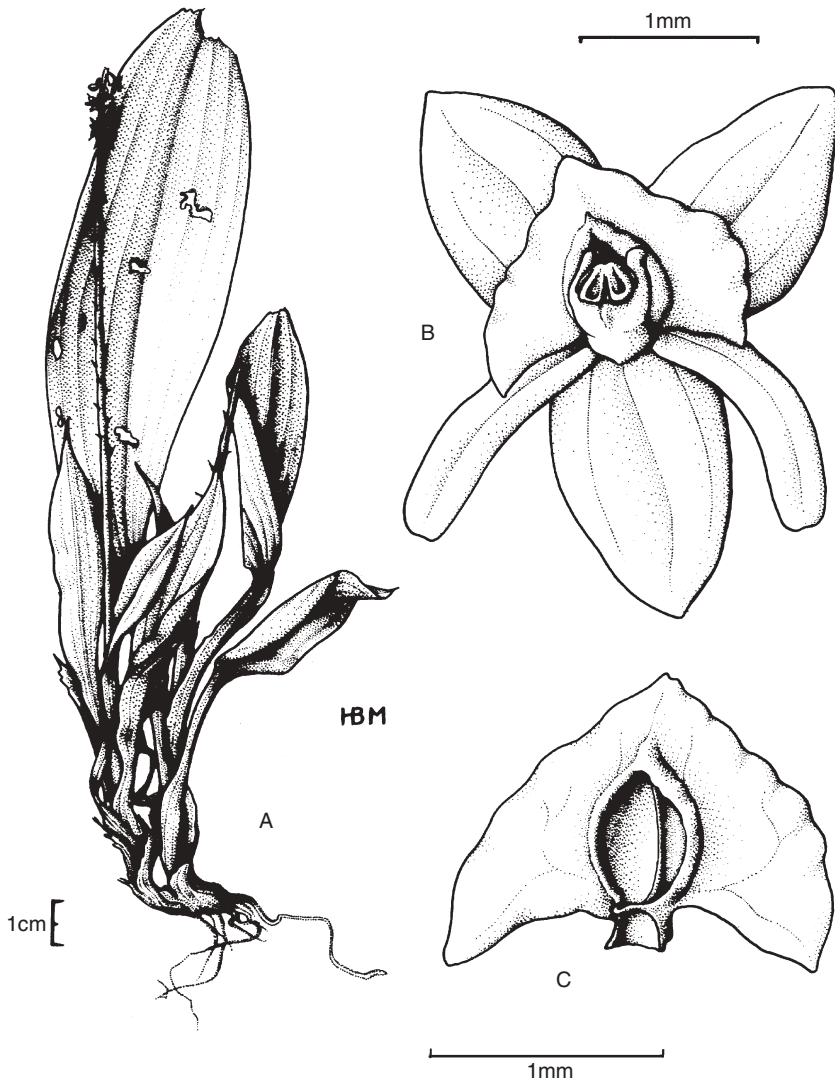


FIG. 2. *Crepidium carrii* (Seidenf. & J.J.Wood) M.A.Clem. & D.L.Jones: A, whole plant; B, flower; C, lip. (Carr 228, holotype.)

(4)10–15(17) × (2)2.5–4(5)cm, ovate-lanceolate, attenuate to acute, 3–5(7)-veined, bright green, paler beneath. *Inflorescence* 15–20cm, slightly exceeding youngest leaf; raceme 10–12 × 1.5–1.8mm, many-flowered, dense; peduncle 5–8 × 1.8–2.3mm. Sterile bracts few, 0.5–0.8 × 0.9–1.5mm, triangular, 1-veined, erect or slightly recurved from the stem. Floral bracts 0.3–0.6 × 0.6–1mm, narrowly lanceolate, acute, 1-veined. Ovary plus pedicel 3.5–4.5mm long, deep purple. *Flowers* 3.2–3.7 × 2.3–2.6mm. Tepals pale purple, lip pale yellow, bright purple towards margins

and apex, gynostemium and anther pale yellow. Tepals widely spread to recurved; sepals broadly ovate to broadly elliptic, obtuse to subacute, 3-veined. Dorsal sepal $1.4\text{--}1.6 \times 0.8\text{--}1.1\text{mm}$. Lateral sepals $1.3\text{--}1.5 \times 0.7\text{--}0.9\text{mm}$, oblique. Petals $1.4\text{--}1.6 \times 0.2\text{--}0.4\text{mm}$, linear, very slightly falcate, slightly recurved, broadly obtuse to slightly retuse at apex, 1-veined, reflexed. Lip $1\text{--}1.2 \times 1.4\text{--}1.6\text{mm}$, triangular, outer margins wavy; mid-lobe $0.3\text{--}0.4\text{mm}$ long, subacute; lateral lobes obovate, auricles very short, triangular, subacute, sometimes slightly falcate, widely spread; middle part of lip somewhat thick and fleshy; blade of lip dominated by large central cavity $0.4\text{--}0.5 \times 0.3\text{--}0.4\text{mm}$, $0.2\text{--}0.3\text{mm}$ deep, ovate to broadly lanceolate, surrounded by high, somewhat erose rim; basal callus delicate, obtuse to slightly retuse at apex. Gynostemium $0.5\text{--}0.6 \times 0.4\text{--}0.5\text{mm}$, relatively large and robust; staminodes oblong, slightly sinuate, obtuse.

Ecology. Terrestrial, on humus between limestone rocks, under bushes in forests. Flowering in November.

Distribution. Endemic to Gunung Senyum, Pahang, Peninsular Malaysia.

Specimens examined. Known only from the type collection.

Originally Carr 228 (K) was incorrectly determined as *Microstylis micrantha* Ridl. (non Hook.f.). Seidenfaden examined the specimen and noted its similarity to *Microstylis tenuis* Ridl. However, *Crepidium carrii* is easily distinguished by its larger leaves, shorter inflorescence, smaller flowers, lip triangular in outline, mid-lobe entire at apex and merging with lateral lobes, strongly abbreviated auricles of lip lateral lobes, and large ovate staminodes, distinctly longer than anther.

3. *Crepidium cordiglottis* (J.J.Sm.) M.A.Clem. & D.L.Jones, Lasianthera 1: 35 (1996). Fig. 3.

Syn.: *Microstylis cordiglottis* J.J.Sm., Bull. Jard. Bot. Buitenzorg Ser. 3, 10: 34–35 (1928). Type: Indonesia, Sumatra, W coast, Padangsche Bovenlanden, Laras Talang, G. Talang, 28 x 1918, *Bunnemeijer* 5224 (holo. L-930 258-39!, iso. BO, spirit coll. BO n.v.).

Fingardia cordiglottis (J.J.Sm.) Szlach., Fragm. Flor. Geobot., Suppl. 3: 134 (1995).

Plant 28–31cm tall, commonly clustered. Roots 1–6cm long, borne on basal nodes of pseudobulbs. Pseudobulbs 9–10cm long, few-noded, fleshy; basal scales few, tubular, acute to acuminate, green. *Leaves* c.3; sheath 1.2–2cm, tubular, pale green; petiole 0.8–1.2cm, widening near base into sheath; blade 7–9.25 × 4.5–5cm, ovate to oblong-ovate, basally rounded, attenuate to acuminate, oblique c.5-veined, green with light violet veins above, pale violet beneath. *Inflorescence* 19–21cm; raceme 6–8cm, many-flowered, dense, with violet tint; peduncle 10–13cm long, weakly angular, with sterile bracts. Floral bracts 2.5–5 × 0.3–0.7mm, lanceolate, concave, acuminate, strongly reflexed, 1-veined, violet-green. Ovary c.17mm; pedicel c.6mm, violet-green

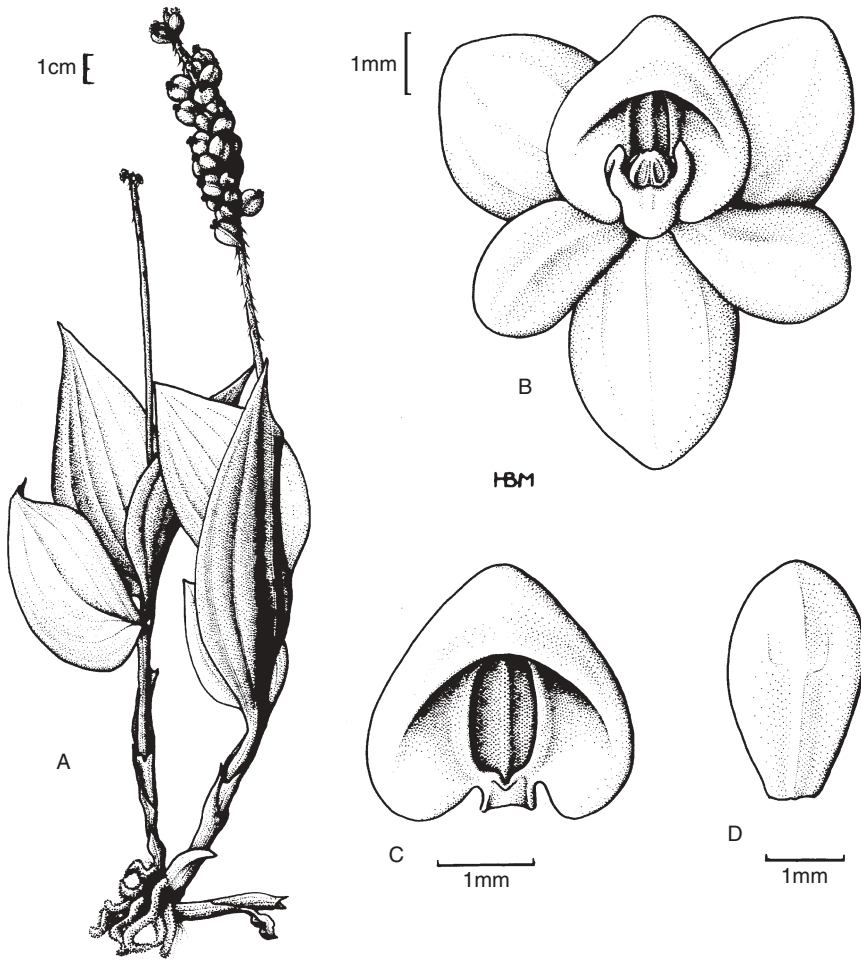


FIG. 3. *Crepidium cordiglottis* (J.J.Sm.) M.A.Clem. & D.L.Jones: A, whole plant; B, flower; C, lip; D, left petal. (*Bunnemeijer* 5224, holotype.)

to violet. *Flowers* 5.5–5.8 × 4.2–4.4mm, fleshy. Tepals reflexed, violet. Dorsal sepal 3–3.3 × 2.2–2.5mm, ovate to broadly ovate, truncate, convex, 3-veined. Lateral sepals 2.9–3.2 × 2.5–2.7mm, oblique, broadly ovate to orbicular, convex, obtuse at apex, margins recurved, 3-veined. Petals 3–3.1 × 1.6–1.8mm, oblique, narrowly obovate, obtuse, 1-veined, main vein sometimes branched apically. Lip 2.6–2.8 × 2.5–2.6mm, cordate, margins entire; mid-lobe 0.8–1 × 1.4–1.7mm near base, slightly recurved, obtuse to subacute; lateral lobes subovate, auricles 0.3–0.4 × 0.9–1.1mm near base, rounded; central cavity 0.9–1.1 × 0.5–0.6mm, 0.1–0.3mm deep, oblong elliptic, with distinct rim; apical part of fovea concealed by thick, broad, distinctly convex, entire, semi-lunate crease; basal callus prominent, obtuse to gently

retuse. Gynostemium c.1.5 × c.1mm; staminodes ovate, obtuse; anther 0.4–0.5 × 0.6–0.7mm, bright coloured. *Fruit* 8.5–10mm long, oblong obovate, pedicel 1.7–2mm long.

Ecology. Terrestrial, on humus in forest. Flowering in October.

Distribution. Indonesia. Endemic to Gunung Talang in W Sumatra. c.1800m.

Specimens examined. So far known only from the type collection.

This species has violet flowers and a distinctive lip. It appears similar to *C. kobi* (J.J.Sm.) M.A.Clem. & D.L.Jones, and especially to *C. tenggerense* (J.J.Sm.) M.A.Clem. & D.L.Jones (both from Java), and also to *C. carinatum* (Rchb.f.) Marg. (from the Philippines). However, *C. cordiglottis* has distinctly fleshy flowers, a characteristic cordate lip with fovea concealed by an entire semi-lunate crease, orbicular lateral sepals and narrowly obovate petals.

4. *Crepidium kobi* (J.J.Sm.) M.A.Clem. & D.L.Jones, *Lasianthera* 1: 36 (1996). Fig. 4.

Syn.: *Microstylis kobi* J.J.Sm., *Orch. Java*: 249–250 (1905). Type: Indonesia, Java, Tengger bei Tosari, oberhalb Podokojo, *Kobus* s.n. (holo. BO n.v., illustr. J.J. Smith 1905!).

Malaxis kobi (J.J.Sm.) J.B.Comber, *Orchids of Java*: 143 (1990).

Fingardia kobi (J.J.Sm.) Szlach., *Fragm. Flor. Geobot., Suppl.* 3: 134 (1995).

Plant 11–30cm tall, somewhat delicate. Rhizome 0.3–1cm or absent. Roots 1–6cm, slender, borne on basal nodes of pseudobulbs. Pseudobulbs 2.8–6.5 × 0.3–1cm, few-noded, fleshy, conical at base, partially covered by leaf sheaths and petiole above; basal scales few, tubular, inflated, acuminate to acute; green to purple. *Leaves* c.3; sheath 0.8–2.2 × 0.35–1.1cm, green or usually purplish to purple; petiole 1–2.8 × 0.2–0.7cm, widening near base into sheath; blade (3)6–14 × (1.8)2.5–4.5cm, slightly oblique, broadly lanceolate to lanceolate, cuneate at base, attenuate to acuminate, ascending, c.5-veined, green or purple. *Inflorescence* 7–21cm, purple or sometimes green; raceme 4.5–14cm, 40–70-flowered, slender, delicate, subdense and cylindrical to dense and conical near apex; peduncle 2–5cm, weakly angular. Floral bracts 3–7 × 0.3–1.1mm, lanceolate, attenuate to acuminate, strongly reflexed, 1-veined, purple or sometimes green. Ovary plus pedicel 4.5–6mm, longer in older flowers, purple or sometimes green. *Flowers* 4.8–5.5 × 4.6–5.2mm; purple form: tepals bright purple, shiny, lip paler, especially towards margins; yellow form: tepals yellow to yellowish green flushed crimson, lip yellow. Dorsal sepal 2.4–3 × 1.4–1.5mm, oblong-ovate, obtuse, slightly convex, 3-veined. Lateral sepals 2–2.6 × 1.3–1.6mm, oblique, broadly ovate, obtuse to subacute, slightly concave, 3-veined. Petals 2.3–2.9 × 0.6–0.75mm, narrowly lanceolate to oblanceolate, obtuse to subacute, slightly falcate, 1-veined, reflexed. Lip 1.5–1.8 × 1.4–1.6mm when spread, triangular, distal margins slightly recurved; mid-lobe entire, obtuse to acute, merging with lateral lobes; lateral lobes semi-obovate to triangular; auricles 0.3–0.5 × 0.5–0.7mm,

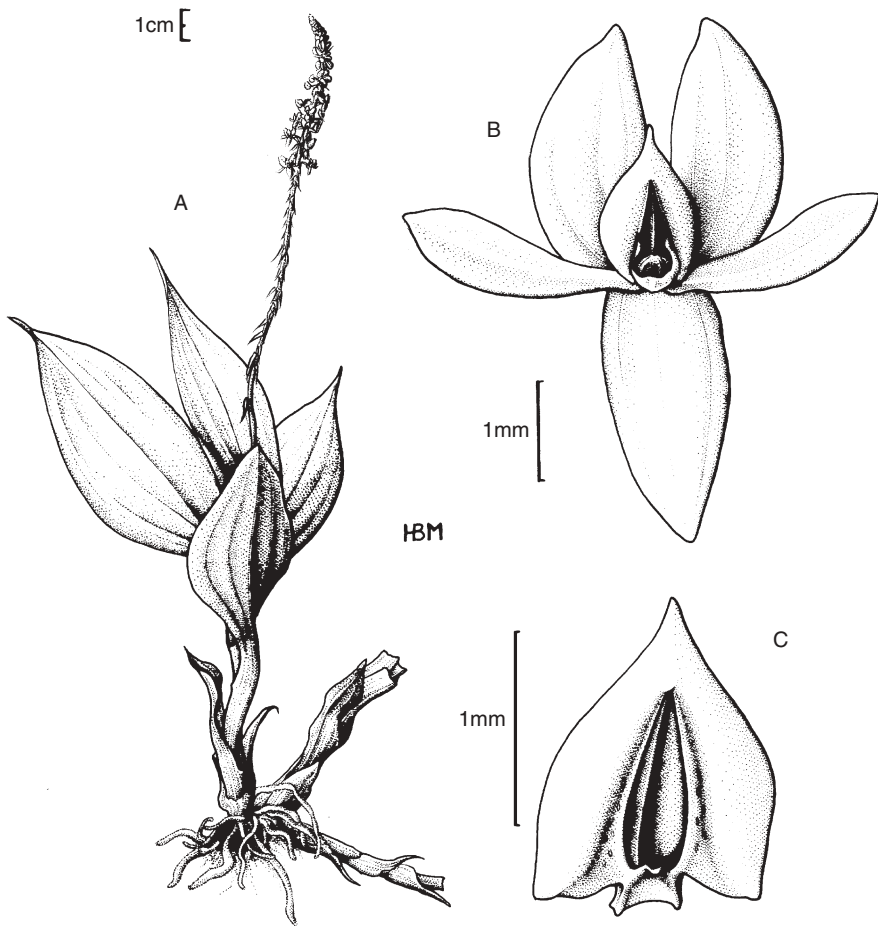


FIG. 4. *Crepidium kobi* (J.J.Sm.) M.A.Clem. & D.L.Jones: A, whole plant; B, flower; C, lip. (A, Comber 1360; B & C, Kobus s.n., holotype.)

obtuse to acute; middle portion of the lip triangularly concave; central cavity 0.9–1.1 × 0.3–0.5mm, 0.2–0.4mm deep, broadly lanceolate with distinct rim; basal callus prominent, obtuse. Gynostemium 1.1–1.3 × 0.8–1mm, stout, green; staminodes narrow, sinuate, obtuse; anther c.0.3 × 0.38–0.42mm, pale. Fruit 0.8–1cm long, oblong.

Ecology. Terrestrial, sometimes on bases of tree-trunks; on rich soil or humus in semi-open and shady places in primary forest, also in grassy localities. Flowering January–April and November.

Distribution. Indonesia, endemic to mountains in E and C Java. 900–2000m.

Specimens examined. INDONESIA. Java: Telaga Bodas, Gerut, Ridley s.n. (K), Nymph's bath, Iosari, Senggar, 29 i 1915, Ridley s.n. I, II (K); Tengger bei Tosari, van Steenis 11927 (BO),

Telamaja, *van Leeuwen* 241 (BO), Unanaj bij Candi, *van Leeuwen & Reijnvaan* s.n. (BO), Sela, Merbabu, *van Leeuwen & Reijnvaan* 1117 G (BO), Kledoeng, *Leeuwen* 1150 (spirit coll. BO); E part of the island, Telomojo, *Leeuwen* 241 (spirit coll. BO), G. Argowayang: N of Pujon, 18 iii 1979, *Comber* 1049 (K), 27 ii 1983, *Comber* 1408 (K), W of G. Arjuno, 27 iv 1986, *Comber* 1639 (K); Central part of the island, G. Slamet, S side, 2 xi 1982, *Comber* 1360 (K), G. Lawu boven Ngrambe, *Backer* 6748 (BO, spirit coll. BO); W part of island, Malang, *Brink* s.n. (BO); Dieng, *Besser* s.n., *von Graevenitz* s.n. (BO), *Backer* 21634, 21861 (BO, spirit coll. BO); N Sendara, Weg Jumprit-Sihajak, *Lorzing* 114 (BO); without precise locality, *Leeuwen* 4590 (spirit coll. BO). Bali: *Comber* 1383 (photo. *Comber*). CULT.: In Hort. J.J. Smith, from Nongko Djadjar, *Buysman* 55 (BO).

There are two colour forms of this species: the more common one has a purplish tint and purple flowers; a rarer form is green with yellow flowers. Based on floral morphology, *C. kobi* appears most closely related to *C. cordiglottis* (J.J.Sm.) M.A.Clem. & D.L.Jones and *C. tenggerense* (J.J.Sm.) M.A.Clem. & D.L.Jones.

5. *Crepidium maximowiczianum* (King & Pantl.) Szlach., *Fragm. Flor. Geobot.*, Suppl. 3: 129 (1995). **Fig. 5.**

Syn.: *Microstylis maximowicziana* King & Pantl., *J. Asiat. Soc. Beng.* 64: 329 (1895). Type: India, Sikkim Himalaya, on the Mungpoo Cinchona Plantation, vii 1892, *Pantling* coll. 226 (holo. BM000082883!, iso. K!).

Malaxis maximowicziana (King & Pantl.) T.Tang & F.T.Wang, *Acta Phytotax. Sin.* 1: 72 (1951).

Plant 8–20cm tall, robust. Roots c.1–10cm, clustered at basal nodes of shoot. Rhizome 5–10 × 2.7–4.8mm. Pseudobulbs (of various ages) 7–15(18) × 5–10(13)mm, 4–7-noded, ovoid, whitish; basal scales few, tubular, inflated, acuminate to acute. *Leaves* 4–5; sheath 1.3–2.8 × 0.6–1.2(1.5)cm, slightly inflated, green with yellow to brownish tint; petiole 1.2–3 × 0.6–1cm; blade (5)13–17 × (2.3)3.8–7cm, slightly oblique, elliptic to elliptic-lanceolate, cuneate at base, attenuate to acuminate at apex, usually 7-veined, green. *Inflorescence* 20–28cm; raceme 10–15 × 1.5–2mm, many-flowered, dense; peduncle 10–13 × 2–2.4mm. Sterile bracts few, 8–12 × 0.9–1.7mm, at 90°. Floral bracts 3–7 × 0.6–1.1mm, linear to lanceolate, acute, 1-veined, equal to or exceeding stalked ovary, strongly recurved. Ovary 2.5–3 × 0.7–1mm, yellow with olive tint, ribs and convex surface of ovary minutely crenate; peduncle 2–3 × 0.6–0.8mm, ribs smooth, brownish yellow. *Flowers* 3.8–5 × 3–4mm, green. Tepals with lateral margins slightly recurved. Dorsal sepal 2.4–2.8 × 0.8–1.2mm, oblong, obtuse to subacute, 3-veined. Lateral sepals 2.2–2.5 × 1.2–1.4mm, oblique, ovate, acute to subapiculate, concave, 3-veined. Petals 2.3–2.6 × 0.6–0.7mm, linear, obtuse, sinuate, 1-veined, reflexed. Lip 1.9–2.1 × 2.6–3mm, orbicular to transversely elliptic when spread, hood-shaped, strongly concave, distal margin slightly thickened and recurved, and crenate; mid-lobe apiculate, gradually merging with lateral lobes; auricles of side lobes 0.3–0.5 × 0.9–1.1mm at base, triangular, subfalcate, acute; central part of lip with broadly ovate concavity 1–1.2 × 0.8–1mm, 0.1–0.3mm deep, surrounded by obscurely convex ridge; cavity 0.8–0.9mm long, 0.1–0.2mm deep, broadly ovate to orbicular, with slender rim, closed below by basal callus, truncate

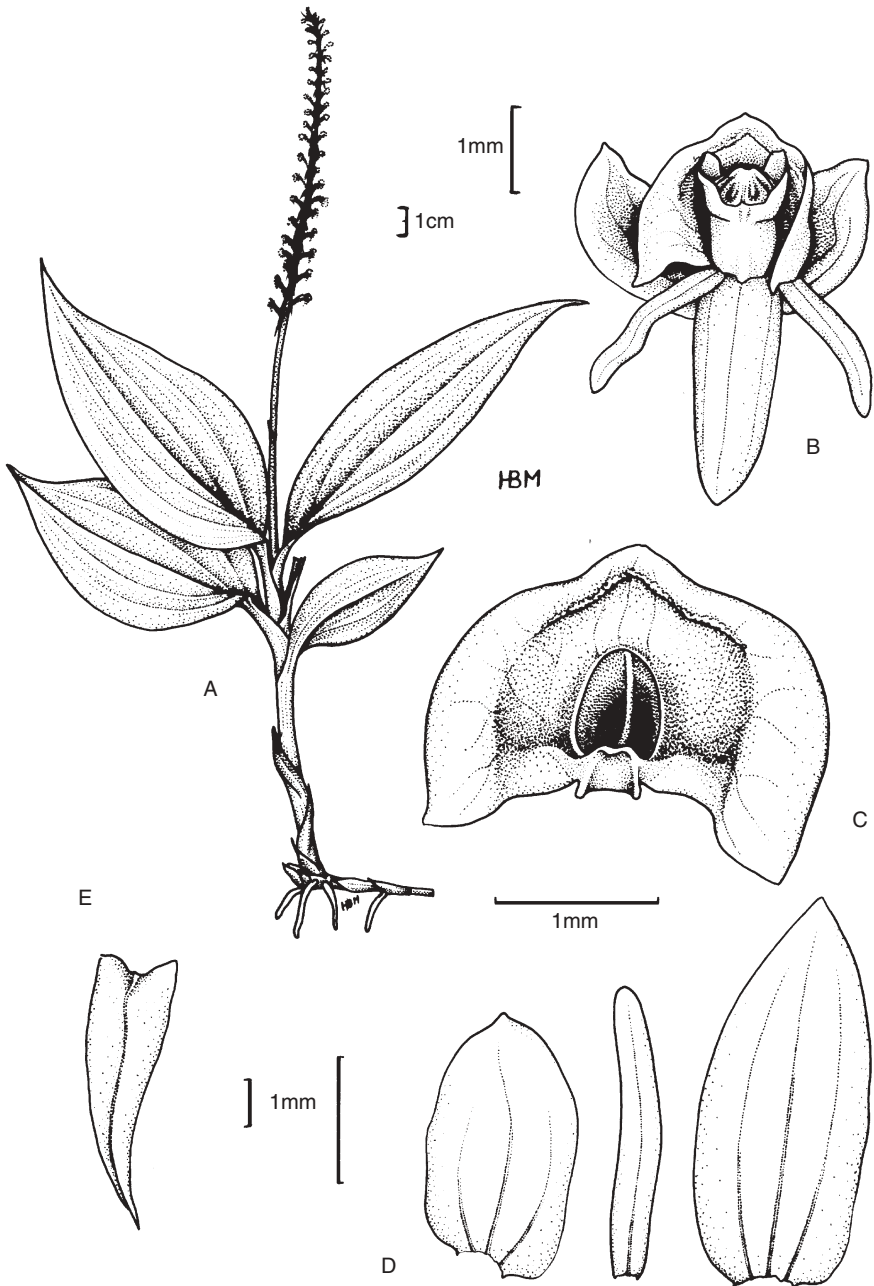


FIG. 5. *Crepidium maximowiczianum* (King & Pantl.) Szlach.: A, whole plant; B, flower; C, lip; D, tepals; E, floral bract. (Pantling coll. 226, holotype.)

to slightly retuse at apex. Gynostemium 1.3–1.6 × 0.9–1.1mm; staminodes broad, flat, commonly overlapping and hiding the anther; stigma large, rostellum truncate.

Ecology. Terrestrial, amongst long grass in open places. Flowering in July. Self-fertile.

Distribution. India: Sikkim to Meghalaya. 610–1300m.

Specimens examined. INDIA. Khasia Hills, *J.D. Hooker f.* 99 (K-L, specimens on left only), Cherrapunjee, *Koelz* 30344 (K).

Specimen cited. Meghalaya, Jaintia Hills, *Rita* s.n. (n.v., fide King & Pantling, 1898; Bruhl 1926).

This species is easily distinguished by the characteristic hood-shaped lip, with reduced, acute auricles on the lateral lobes. It is usually noted as being self-fertile, a rare feature in this genus.

6. *Crepidium tenggerense* (J.J.Sm.) M.A.Clem. & D.L.Jones, *Lasianthera* 1: 40 (1996). Fig. 6.

Syn.: *Microstylis tenggerensis* J.J.Sm., *Bull. Dep. Agr. Ind. Neerl.* 43: 28–30 (1910). Type: Indonesia, E Java, Tengger bei Nongko djadjar, *Buysman* s.n. (holo. BO n.v., illustr. J.J. Smith 1910!).

Malaxis tenggerensis (J.J.Sm.) Bakh.f., *Blumea* 12: 67 (1963).

Fingardia tenggerensis (J.J.Sm.) Szlach., *Fragm. Flor. Geobot., Suppl.* 3: 134 (1995).

Plant 11–30cm tall, rather delicate. Roots 1–6cm, numerous, clustered at base of shoot. Pseudobulb 4–4.5 × 0.4–0.6cm, few-noded, fleshy, thicker near base, enclosed by a few, tubular, inflated, acuminate to acute basal scales. *Leaves* c.5; sheath 1.2–1.8 × 0.5–0.8cm, inflated, purple; petiole 0.6–1.2cm long; blade 4–9.5 × 1.8–2.3cm, oblique, ovate to lanceolate, attenuate, acute, slightly undulate, 5–7-veined; green. *Inflorescence* c.15cm; raceme c.8cm, many-flowered, dense, axis purple to green; peduncle c.7cm, pale green, flushed purple. Sterile bract commonly 1, recurved. Floral bract 3–4 × 0.3–0.7mm, lanceolate, acuminate, 1-veined, recurved, green or purple. Ovary pale greenish with ochre tint; pedicel green with purple ribs, pedicel plus ovary c.3mm. *Flowers* c.4.5 × c.5mm, tepals ochre, dorsal sepal purple-tinged near base, lip ochre, red-purple near central cavity. Tepals widely spread, lateral margins recurved. Dorsal sepals 2.9–3.1 × 1.7–1.8mm, ovate, obtuse, slightly convex, 3-veined. Lateral sepals c.2.7 × 1.7–1.9mm, oblique, broadly ovate, obtuse, convex, 3-veined. Petals c.2.7 × c.0.7–0.8mm, lanceolate, obtuse to subacute, slightly cuneate at base, slightly falcate, convex, 1-veined. Lip 2.2–2.3 × c.2.4mm when spread, triangular to cordate, entire, distal margins slightly reflexed; mid-lobe triangular, obtuse to acute, merging into lateral lobes; lateral lobes obovate to triangular, auricles c.0.4 × 0.5–0.7mm, obtuse to acute; middle part of lip triangularly concave; central cavity lanceolate, 0.9–1 × 0.2–0.3mm, 0.2–0.3mm deep, with distinct rim and small

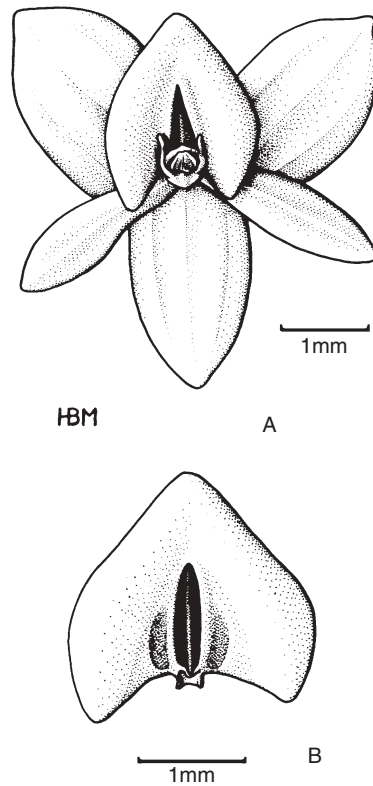


FIG. 6. *Crepidium tenggerense* (J.J.Sm.) M.A.Clem. & D.L.Jones: A, flower; B, lip. (From J.J. Smith's drawing of holotype.)

oblong concavities each side of base; basal callus minute, retuse. Gynostemium 0.9–1.1mm, green with ochre tint; staminodes obtuse; anther c.0.4 × c.0.5mm, lemon-yellow with white margin.

Ecology. Terrestrial, in forest.

Distribution. Indonesia. Endemic to Gunung Tengger in E Java.

Specimen cited. INDONESIA. Cultivated, Purwodadi Botanic Gardens in 1979 (n.v., fide Comber, 1990).

At first, J.J. Smith recognized Buysman's specimen as a different form of *Microstylis kobi* J.J.Sm. (*Crepidium kobi* (J.J.Sm.) M.A.Clem. & D.L.Jones). He noted that both forms grew in the same habit and even at the same localities, in mixed populations. Based on later, more precise studies, he acknowledged it as a separate species. Unfortunately J.J. Smith described *M. tenggerensis* on the basis of the single plant (BO). In 1979 it was found in Gunung Tengger, and cultivated for at least a year in

Purwodadi Botanic Gardens (Comber, 1990). *Crepidium tenggerense* can be distinguished from *C. kobi* by a number of features: petiole somewhat longer, leaf blade narrower and smaller; bracts, ovary and pedicel shorter; ochre and red-purple colour of flowers; dorsal sepals wider than long; distinctive lip, slightly larger and more cordate in outline, with additional small concavities on each side of the base of the central cavity.

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