

Materials towards a revision of the genus *Pseudoliparis* (Orchidaceae, Malaxidinae). 3. Section *Pseudoliparis*

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This paper is the first part of a taxonomic revision of the type section of the genus *Pseudoliparis* (Orchidaceae, Malaxidinae). One new species is described. Lectotypes are selected for *Pseudoliparis laevis* (Schltr.) Szlach. & Marg. and *Pseudoliparis undulata* (Schltr.) Szlach. & Marg.

Key words: Malaxidinae, nomenclature, Orchidaceae, *Pseudoliparis*, taxonomy

This paper is the first part of a taxonomic revision of the type section of the genus *Pseudoliparis* (Orchidaceae, Malaxidinae). It treats 17 species and contains a description of one new species.

I examined herbarium specimens and spirit materials kept at AMES, B, BM, BO, C, K, L, SING and US. All available published and unpublished illustrations and literature were studied by me as well.

At present, the genus *Pseudoliparis* has 41 species, of which 33 belong in the type section. The representatives of the section are distinguished by presence of appendage(s) or distinctly convex dorsal surface of the column part.

In the species dealt with here, the gynostemium dorsal appendage(s) is always placed at half of column length or above. In the remaining species of the type section the appendage is always in the lower half of the column (#, see key to the species below) and they will be treated in the fourth part of this series of articles.

Pseudoliparis Finet

emend. Szlach. & Marg., *Adansonia* ser. 3, 21(2): 275–282. 1999.

Pseudoliparis Finet, *Bull. Soc. Bot. France* 54: 536. 1907. — *Crepidium* Bl. *emend.* Szlach. subg. *Pseudoliparis* (Finet) Szlach., *Fragm. Flor. Geobot., Suppl.* 3: 123. 1995. — Generitype: *Pseudoliparis epiphytica* (Schltr.) Finet.

Key to the sections of *Pseudoliparis*

1. Dorsal part of gynostemium column with appendage(s) or distinctly convex sect. *Pseudoliparis*
1. Dorsal part of gynostemium column flat and smooth, without any appendages and not distinctly convex sect. *Oistochilus*

Pseudoliparis section *Pseudoliparis*

Microstylis (Nutt.) Eaton sect. *Pseudoliparis* (Finet) J.J. Sm., *Bull. Dept. Agri. Ind. Neerl.* 22: 22. 1909. — *Microstylis* (Nutt.) Eaton sect. *Pseudo-Liparis* Schltr., *Repert. Spec.*

Nov. Regni Veg. Beih. 1: 112. [1911] 1914. — *Malaxis* Sol. ex Sw. sect. *Pseudoliparis* (Finet) Seidenf., Bot. Tidskr. 73: 102. 1978. — *Crepidium* Bl. emend. Szlach. subg. *Pseudoliparis* (Finet) Szlach., Fragm. Flor. Geobot., Suppl. 3: 123. 1995.

The representatives of the section are rather small (mostly up to 30 cm tall), terrestrial or epiphytic plants. They grow as single shoots or in small clusters. Rhizomes are usually abbreviated, only sometimes creeping or branched, stem-like, with nodes covered by tubular scales. Roots are filiform, flexuous, pubescent, arising from nodes of rhizome and usually from base of stem. Leafy stem is commonly few cm high, partly to completely covered by leaf petioles, sheaths and basal scales. Stems are usually with few leaves, only some species generate more than ten leaves. Leaf petioles are always amplexicaul and canaliculate, tubularly sheathed at base. Leaf blades are membranaceous, diverse in shape. Inflorescence is erect or pendant (*Pseudoliparis curvatula*), racemose, with a dozen to 20, 40, 60, etc. of flowers. Flowers are middle-sized, odourless or with weak fragrance. Sepals are 3-veined, whereas the petals have just one vein. Lip is hippocrepiform to sagittate, with a lamellate or flat lamina. Appendage(s) of the gynostemium is always positioned at half of column length or above. Size, shape and particularly form of distal margins of staminodes are taxonomically important features. The staminodes are of two forms: (1) elongate, higher than anther, simple, transversely truncate at distal margins; (2) abbreviated, at most as long as anther, with distal margins obliquely narrowed up to their apices. Anther is usually narrowly ovate to obcordate, and stiffly fused with the column top, whereas rostellum is similar in size and shape to the anther, always erect and adnate to the top of the anther.

Key to the species of the section *Pseudoliparis*

1. Appendage(s) of gynostemium always at half column length or above 2
1. Appendage of gynostemium always below half column length, near gynostemium base # (see above)
2. Staminodia elongate, higher than anther, with distal margins simple, transversely truncate 3
2. Staminodia abbreviated, at most as long as anther, with distal margins obliquely narrowed up to apices 10
3. Petals oblanceolate to spatulate, widest in upper half .. 4
3. Petals linear to lanceolate, widest in middle part or near base 6
4. Main nerve of petals with branches (usually 3 or 4); lip lamina with a characteristic binate, convex set of calli between lamellae *P. balabacensis*
4. Main nerve of petals always simple, without branches; lip lamina only with simple lamellae 5
5. Leaves linear-ligulate; petals spatulate; lip hastate *P. undulata*
5. Leaves elliptic; petals linear-ligulate; lip elliptic to obovate *P. umbonata*
6. All leaves broad, ovate; gynostemium appendage shortly conelike 7
6. Older leaves ovate-lanceolate or elliptic-lanceolate; appendage elongate, elongate-conelike to linear 8
7. Plant about 10 cm tall; lateral sepals ovate, acute at apex, cuneate at base *P. schumanniana*
7. Plant large 20–30 cm tall; lateral sepals oblong-ovate, obtuse at apex, slightly obcordate at base *P. macrotis*
8. Dorsal sepal simply narrowed from 1/3 of length to acute apex; lip widest above its base, with lamina nearly smooth, lamellae weakly visible *P. laevis*
8. Dorsal sepal arcuately narrowed from 1/4 of length to obtuse apex; lip widest below its base, with distinct and elongate lamellae 9
9. Leaves ca. elliptic; gynostemium appendage erect, perpendicular to column, abbreviated, thick, conelike *P. curvatula*
9. Leaves ca. ovate; gynostemium appendage oblique relative to column, distinctly elongate, thin, with a strongly convex base *P. toricellensis*
10. Petals linear 11
10. Petals lanceolate to oblanceolate 14
11. Leaves oblong-ovate; entire gynostemium arcuately recurved, with a minute appendage; staminodes truncate at apices *P. incurva*
11. Leaves narrow, lanceolate or oblanceolate; gynostemium erect, with large appendage(s); staminodes recurved, obliquely truncate at apices 12
12. Lip lamina with simple lamellae; gynostemium appendage distinctly truncate, flat at apex *P. seleniglossa*
12. Lip lamina with other kind of ornamentation; gynostemium appendage(s) with an elongate apex 13
13. Sepals ovate; lip lamina with two, parallel, erect, triangular lamellae along main nerves; gynostemium appendage with one elongate tip *P. epiphytica*
13. Sepals elliptic; lip lamina with lyriform lamellae at upper part; gynostemium appendages with two elongate tips *P. diploceras*
14. Petals oblanceolate, falcately curved; lip lamina not with simple, parallel lamellae 15
14. Petals asymmetrically lanceolate, erect; lip lamina with simple, parallel lamellae reaching to lamina apex 17
15. Petals obtuse; lip lamellae short, reaching to about half of lamina length; gynostemium appendage broadly flattened at apex, bent backwards *P. kortylewskiana*
15. Petals attenuate, acute; lip lamina without lamellae, gynostemium appendage attenuate at apex 16
16. Lip lamina with two small, clavate calli at upper part;

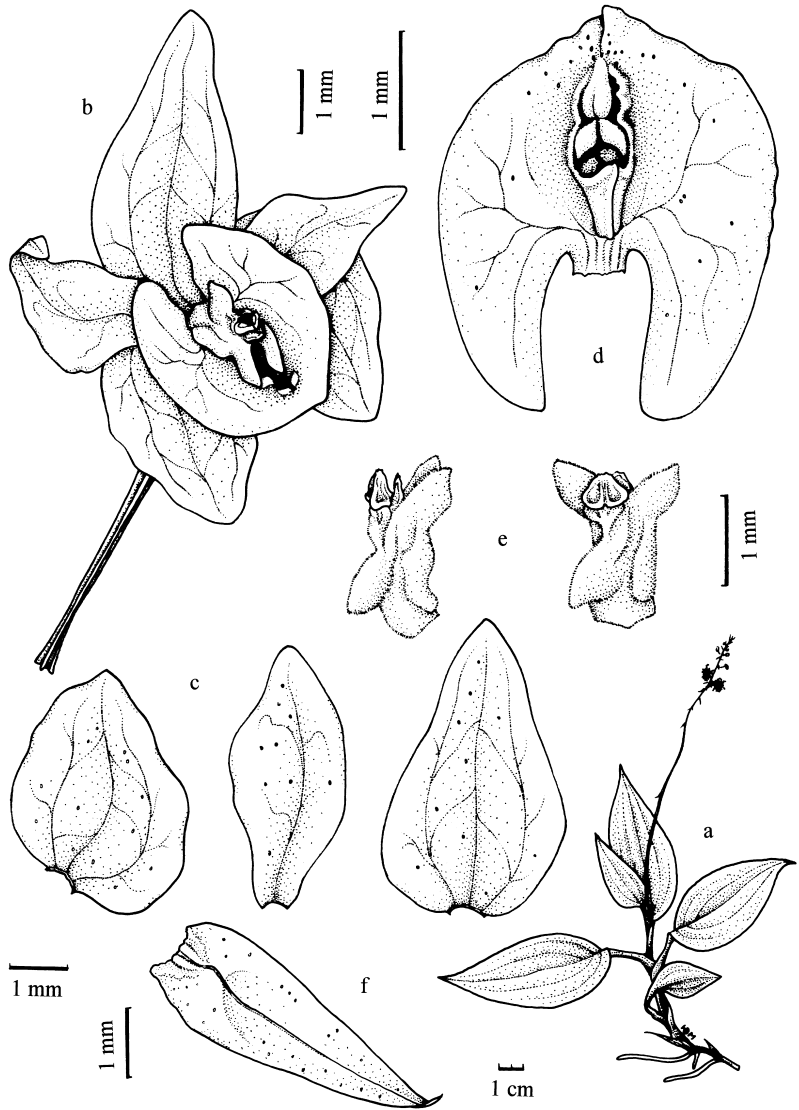


Fig. 1. *Pseudoliparis balabacensis* (from holotype). — **a:** Plant. — **b:** Flower. — **c:** Tepals. — **d:** Lip. — **e:** Gynostemium, side and front view. — **f:** Floral bract.

- auricles distinctly elongate, crossing over at apex; gynostemium appendage erect, large, attenuate, perpendicular to column *P. curviauriculata*
16. Lip lamina slightly concave at middle strip; auricles medium-sized, erect, parallel; gynostemium appendage falcately bent backwards *P. gregorii*
17. Dorsal sepal oblong-elliptic; entire lip about elliptic to orbicular, top of lip nearly round *P. tubulosa*
17. Dorsal sepal ovate, longly attenuate at apical part; entire lip ca. obovate, top of lip minutely apiculate 18
18. Dorsal sepal obtuse at apex; lip auricles abbreviated, shorter than lamina; gynostemium appendage elongate, strongly bent backwards *P. breviscapa*
18. Dorsal sepal acute; lip auricles elongate, longer than lamina; gynostemium appendage abbreviated, erect, conelike *P. brachycaulos*

***Pseudoliparis balabacensis* (Ames) Marg. & Szlach. (Fig. 1)**

Ann. Bot. Fennici 40: 63. 2003. — *Malaxis balabacensis* Ames, Philipp. J. Sc., Bot. 6: 42–43. 1911. — *Crepidium balabacense* (Ames) Szlach., Fragm. Flor. Geobot., Suppl. 3: 124. 1995. — TYPE: Philippines. Balabac Island, *Merril 5374* (holotype US!; isotypes AMES!, K!, PNH)

Plant 10–40 cm tall, single or sometimes compactly clustered. Rhizome 1.5–3.7 mm diam., elongate, sometimes branched, node scales loose. Leafy stem (2)3–6(7.5) cm long, 0.28–0.65(0.78) cm diam., erect, fusiform, com-

pletely covered by leaf petioles and sheaths. Leaves (3)4–6(12); leaf petiole (1.4)2.2–4.8 cm long, (0.5)0.8–1.3(1.8) cm wide when spread; leaf sheath (0.6)1–2(2.8) cm long, (0.3)0.4–0.7(0.8) cm diam., green, fawn-tinged; leaf blade (3)4–5.2 cm long, 1.2–1.8 cm wide, slightly oblique, ovate to oblong-ovate, attenuate, apiculate at apex, (3)5(7)-nerved, green to dark-green above, paler beneath. Inflorescence (5)10–15(18) cm long; raceme (3)4–7(8) cm tall, 20–60-flowered, dense; peduncle (2)4–7(8) cm long. Sterile bracts usually 1, 4.5–6 mm long, 1.8–2.3 mm wide, lanceolate, reflexed, 1-nerved. Floral bracts 3.5–5.5 mm long, 0.8–1.3(1.6) mm wide, lanceolate, apiculate to acuminate at apex, 1-nerved, deflexed, green. Ovary 1.5–3 mm long, 0.4–0.7 mm diam.; pedicel 2.5–5 mm long, 0.3–0.6 mm diam., sinuate, green to greenish-yellow. Flowers 5–8 mm diam., orange to brownish-yellow. Sepals with branching main nerves. Dorsal sepal (3.2)4–4.5 mm long, (2.5)3–3.3 mm wide, oblong-ovate, distinctly narrowed in upper half, apiculate at apex, slightly obcordate at base. Lateral sepals 3–3.5(4) mm long, (2.2)2.5–3.5 mm wide, obliquely and broadly ovate, apiculate at apex, obcordate at base. Petals (3)3.8–4(4.2) mm long, 1–1.5(1.7) mm wide, slightly falcate, oblanceolate, slightly contracting at upper quarter, obtuse to subapiculate at apex, main nerve with 3–4 branches. Lip (2.8)3–3.5(4) mm long, (2)3–3.5(3.8) mm wide, hippocrepiform; lamina subapiculate at apex, central part with 2 parallel, longitudinal, thin lamellae, 0.8–1.4 mm long, 0.2–0.6 mm high, near middle of lip fused together into a particularly tall connection with gynostemium (basal callus 0.5–0.8 mm high), lamina between lamellae flat and narrow, with two pairs of characteristic, geminate calli (each 0.2–0.5 mm high, 0.3–0.5 mm long, 0.1–0.3 mm wide); lateral lobes auriculate: (1)1.5–2.1 mm long, (0.8)1–1.7 mm wide at base, oblong, obtuse to round at apices, subparallel. Gynostemium (1.3)1.5–1.8 mm long, 0.4–0.7 mm wide, erect, entire surface distinctly and minutely papillose; column recurved at base, pale-yellow to greenish-yellow, in about half of its length with large, often falcately recurved, oblong-ovate appendage, (0.5)0.7–0.9 mm long, 0.4–0.6 mm wide at base; staminodes (0.5)0.6–0.7 mm long, ca. 0.3 mm wide, almost two times longer than anther,

oblong, obliquely truncate at apex, folded back from anther, dark-green; anther 0.4–0.5(0.6) mm long, (0.4)0.5–0.6 mm wide, pale-yellow to white-yellow; rostellum greenish to dark-green. Fruit 7–10 mm long, 4–6 mm diam., oblong-obovate, fawn to yellowish.

This species is quite easily distinguished by the characteristic ornamentation of the middle part of lip, shape of gynostemium, and spatulate petals with a branched main nerve.

DISTRIBUTION: Philippines (Luzon, Leyte, Palawan, Balabac, Mindanao, Sibutu). Alt.: 0–130 m, rarely up to 800 m.

HABITAT ECOLOGY: Terrestrial, in leaf litter on thin layer of humus, on clay; in forest, in dry thickets near seashore, occasionally on beach with coral gravel; common; flowering in October, sometimes in June or August.

REPRESENTATIVE SPECIMENS EXAMINED. — **Philippines.** Balabac: Dalawan Bay, *Sanderman Olsen 586* (C, L); Leyte: *Wenzel s.n.* (AMES, L), Tigbao, Stream Bed, *Frohne 57-171*, Phil. Nat. Herb. No. 35720 (L, PNH); Luzon: Province of Laguna, Mt. Maquiling, *Ramos s.n.*, Bur. Sci. no. 13704 (K), Province of Sorsogon, Irosin, Mt. Bulusan, *Elmer 16347* (K, L), central part of the Island, *Loher 443* (K); Palawan: *Escritor s.n.*, Bur. Sci. no. 21550 (K), *Escritor s.n.*, Bur. Sci. no. 21532 (K); Sulu Archipelago: Sibutu Island, *Merrill 5296* (paratypes AMES, US).

Pseudoliparis brachycaulos (Schltr.) Szlach. & Marg. (Fig. 2)

Adansonia ser. 3, 21(2): 276. 1999. — *Microstylis brachycaulos* Schltr., Repert. Spec. Nov. Reg. Veg., Beih. 1: 117. [1911] 1914. — *Malaxis brachycaulos* (Schltr.) Hunt, Kew Bull. 24: 78. 1970. — *Crepidium brachycaulos* (Schltr.) Szlach., Fragm. Flor. Geobot., Suppl. 3: 124. 1995. — TYPE: Papua New Guinea. Kaiser-Wilhelms-Land, Finisterre Range (Madang Distr.), *Schlechter 18158* (holotype B+).

Plant 6–25 cm tall, slender, erect. Rhizome strongly abbreviated. Leafy stem 1.5–3 cm long, 0.8–1 cm diam., fusiform, grey-green, covered by leaf petioles and sheaths. Leaves 2–3; leaf petiole 0.7–1.5 cm long, 0.5–0.9 cm wide when spread, erect; leaf sheath (0.8)1.5–2.5(2.8) cm long, 0.4–1.1 cm diam., green; leaf blade 3.5–7 cm long, 2–4.3 cm wide, oblique-ovate, oblong-ovate to broadly lanceolate, attenuate, acuminate to apiculate at apex, 3–5-nerved, green to bluish-green above, paler grey-green beneath. Inflores-

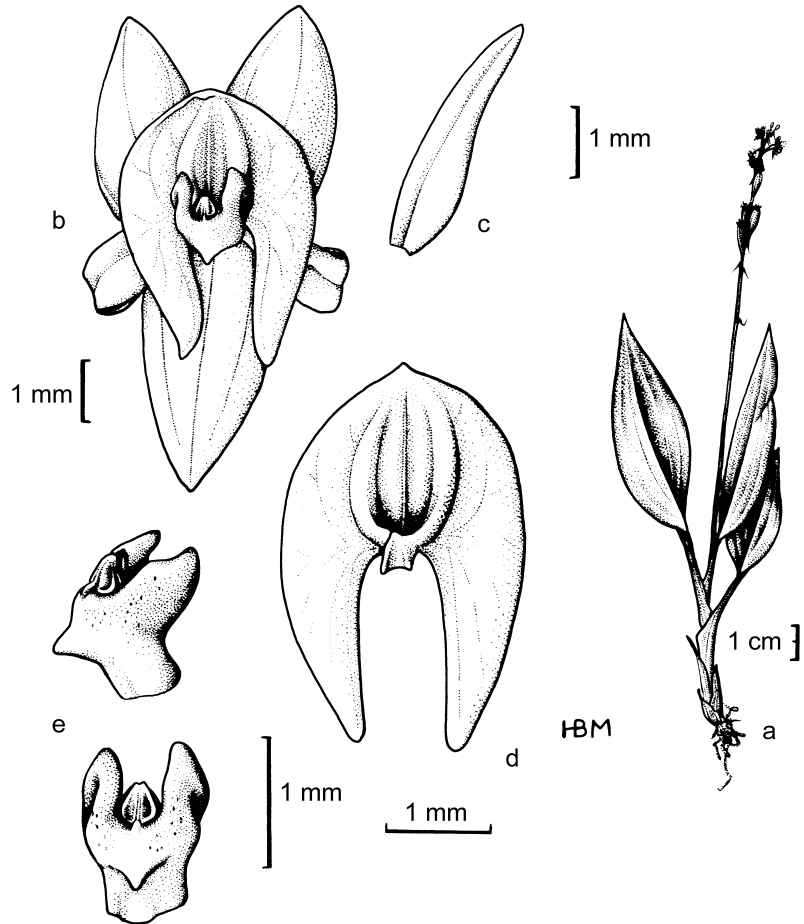


Fig. 2. *Pseudoliparis brachycaulos* (a from Sands, Pattison, Wood & Howcroft SANDS 1851, K; the others from original diagnosis and illustration). — a: Plant. — b: Flower. — c: Petal. — d: Lip. — e: Gynostemium, side and front view.

cence 9–12 cm long; raceme about 2 cm long, 8–20-flowered, dense, rather delicate; peduncle light green. Sterile bract usually 1, ca. 4 mm long, 0.8–1 mm wide, lanceolate, attenuate, acuminate at apex, 1-nerved, erect. Floral bracts 2.5–3.8 mm long, 0.6–0.8 mm wide, lanceolate, acuminate at apex, 1-nerved, recurved. Flowers about 5.5–7 mm long, 3.5–5.6 mm wide, brownish flesh, olive-green towards the centre. Dorsal sepal 4–4.6 mm long, 2–2.6 mm wide, ovate to oblong-ovate, attenuate, subacute to acute at apex, 3-nerved. Lateral sepals 3.5–4.5 mm long, 2.3–3 mm wide, oblique ovate, obtuse to subacute at apex, slightly obcordate at base. Petals 4.8–5.2 mm long, 1.2–1.5 mm wide, oblique lanceolate, obtuse at apex, commonly bent backwards. Lip 4–5 mm long, 2.6–3 mm wide, sagittate, widest slightly above its base; lamina 2–2.5 mm long, semiorbicular at distal part, with a subapiculate top, lamellae 1.6–2 mm long, 0.2–0.4 mm high,

0.2–0.3 mm thick, reaching nearly up to lamina apex, simple, parallel, darker coloured, particularly at distal margins, lamina between lamellae flat and narrow; auricles 2–2.5 mm long, 0.8–1.2 mm wide, elongate, oblique oblanceolate, obtuse to subacute at apices, parallel. Gynostemium 1–1.5 mm long, 0.4–0.6 mm wide, erect, entire surface very minutely papillose; column pale greenish-yellow, with a small, erect, conelike appendage in its upper half, 0.15–0.25 mm long, 0.3–0.4 mm wide at base; staminodes 0.4–0.6 mm long, 0.25–0.32 mm wide, oblong, obliquely truncate at apex, folded back from anther, dark-green; anther 0.4–0.5 mm long, 0.3–0.4 mm wide, pale-yellow to whitish-green; rostellum greenish to dark-green. Fruit ca. 0.8 mm long, ca. 0.4 mm diam., oblong elliptic to oblong-obovate, green to greenish fawn.

This species is similar to *Pseudoliparis breviscapa*, from which it differs by the form of

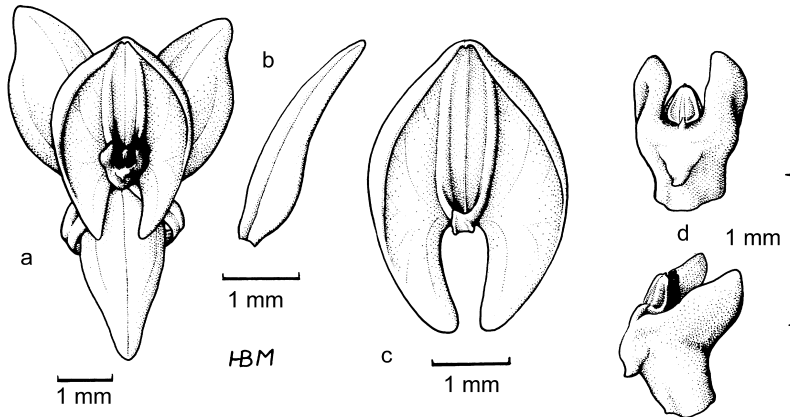


Fig. 3. *Pseudoliparis breviscapa* (from original diagnosis and illustration). — a: Flower. — b: Petal. — c: Lip. — d: Gynostemium, side and front view.

upper part of dorsal sepal, length of lip auricles, and especially by form of gynostemium appendage.

DISTRIBUTION: New Guinea. Alt. 1100–1200 m.

HABITAT ECOLOGY: Epiphytic, sometimes terrestrial; on tree-trunks in forest, also in *Castanopsis* regrowth area near road, amongst leaf mould on bank, in shaded places; flowering in September.

REPRESENTATIVE SPECIMENS EXAMINED. — **Papua New Guinea.** Wau Subprovince, Kaisinik region, SE of Wau, near road to logging area, below Elaro Village, 70°19'S 146°50'E, *Sands, Pattison, Wood, Howcroft SANDS 1851* (K, K-spirit. coll.).

***Pseudoliparis breviscapa* (Schltr.) Szlach. & Marg. (Fig. 3)**

Adansonia ser. 3, 21(2): 276. 1999.

Microstylis breviscapa Schltr., Repert. Spec. Nov. Reg. Veg., Beih. 1: 116. [1911] 1914. — *Malaxis breviscapa* (Schltr.) Hunt, Kew Bull. 24: 78. 1970. — *Crepidium breviscapum* (Schltr.) Szlach., Fragm. Flor. Geobot., Suppl. 3: 124. 1995. — **TYPE:** Papua New Guinea. Kaiser-Wilhelms-Land, the Bismarck Range near Hokrocho (Madang Distr.), *Schlechter 18587* (holotype B+).

Small plant, 10–13 cm tall, erect. Rhizome strongly abbreviated. Leafy stem 2–3.5 cm long, 1–1.3 cm diam., covered by leaf petioles and sheaths. Leaves 2–3; leaf petiole 0.7–1 mm long; leaf sheath 0.5–0.8 mm long; leaf blade 7–12 cm long, 3–5.5 cm wide, obliquely elliptic-ovate to elliptic-lanceolate, attenuate, acuminate at apex, 3–5-nerved, green. Inflorescence 3.5 cm long,

many-flowered, dense. Floral bracts lanceolate, acuminate at apex, 1-nerved, reflexed. Flowers 4.6–5 mm long, 3.8–4.2 mm wide when spread, olive-green, lip brown. Dorsal sepal 3.4–3.5 mm long, 3–3.2 mm wide, ovate, distinctly contracting in apical half, obtuse at apex. Lateral sepals 2.8–3 mm long, 1.9–2.1 mm wide, falcate, oblique ovate, obtuse at apex, one-sidedly obcordate at base. Petals 3 mm long, 0.8 mm wide, oblique, asymmetrically lanceolate, obtuse at apex, usually strongly recurved. Lip ca. 3.5 mm long, 2.5–2.7 mm wide when spread, elliptic-sagittate in outline, margins and apex incurved; lamina 2.5 mm long, obtuse at apex, lamellae 2.2–2.4 long, 0.2–0.3 mm high, 0.1–0.2 mm thick, parallel, vanishing below apex of lamina, lamina between lamellae flat; auricles 1–1.3 mm long, 1–1.2 mm wide, abbreviated, falcately triangular, subparallel, obtuse at apices. Gynostemium about 1–1.2 mm long, 0.4–0.9 mm wide, erect; column pale greenish-yellow, with relatively elongate, conelike, strongly bent down appendage below anther base, 0.3–0.4 mm long, 0.2–0.3 mm wide at base; staminodes 0.4–0.6 mm long, 0.3–0.35 mm wide, oblong, obliquely truncate at apex, folded back from anther, darker coloured; anther 0.4–0.5 mm long, 0.5–0.6 mm wide.

This species resembles *Pseudoliparis brachycaulos*, from which it differs by the dorsal sepals being obtuse at apex, lip with abbreviated auricles, shorter than lamina, and gynostemium appendage elongate and strongly bent backwards.

DISTRIBUTION: New Guinea, known only from type collection. Alt. 1400 m.

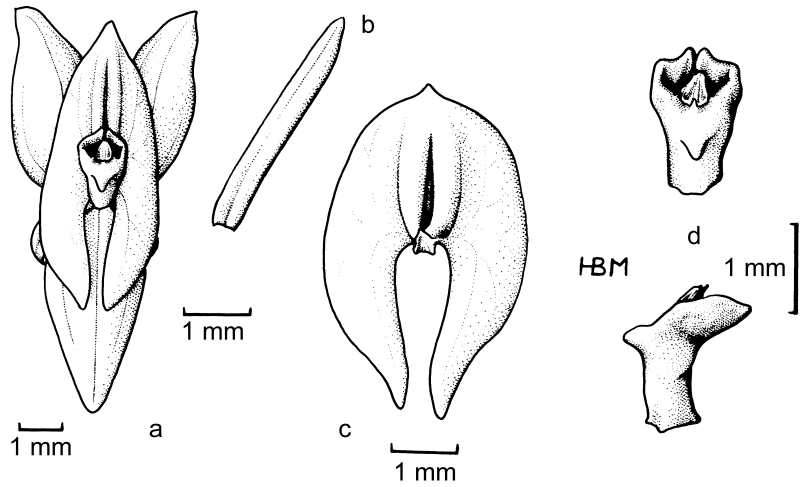


Fig. 4. *Pseudoliparis curvatula* (from original diagnosis and illustration). — **a:** Flower. — **b:** Petal. — **c:** Lip. — **d:** Gynostemium, side and front view.

HABITAT ECOLOGY: Epiphytic, on large tree-trunks in forest; flowering in November.

***Pseudoliparis curvatula* (Schltr.) Szlach. & Marg. (Fig. 4)**

Adansonia ser. 3, 21(2): 276. 1999. — *Microstylis curvatula* Schltr., Repert. Spec. Nov. Reg. Veg., Beih. 1: 117–118. [1911] 1914. — *Malaxis curvatula* (Schltr.) Hunt, Kew Bull. 24: 79. 1970. — *Crepidium curvatulum* (Schltr.) Szlach., Fragm. Flor. Geobot., Suppl. 3: 125. 1995. — TYPE: Papua New Guinea, Kaiser-Wilhelms-Land, Kani Range (Madang Distr.), *Schlechter 17499* (holotype B+).

Plant minute, 4.5–6 cm tall. Rhizome strongly abbreviated. Leafy stem few cm tall, abbreviated, slender, covered by leaf petioles and sheaths. Leaves 2–4; leaf petiole and sheath 0.5–1 mm long; leaf blade 2.5–5.5 mm long, 1.2–2.2 mm wide, elliptic to elliptic-lanceolate, attenuate, acute to acuminate at apex, 3–5-nerved. Inflorescence ca. 3 cm long, slightly pendant; raceme 5–9-flowered, lax; peduncle gracile. Floral bracts ovate, acuminate at apex, amplexicaul, 1-nerved. Flowers 6.8–7.2 mm long, 4.4–4.8 mm wide when spread, orange-yellow. Dorsal sepal ca. 4 mm long, 2.3–2.4 mm wide, ovate, arcuately contracting from 1/4 their length to obtuse apex. Lateral sepal ca. 3.5 mm long, 2.2–2.4 mm wide, sinuate, ovate, obtuse to subacute at apex, one-sidedly obcordate at base. Petals 4–4.2 mm long, ca. 0.8 mm wide, slightly oblique, lanceolate, obtuse at apex, strongly bent backwards. Lip ca. 6 mm long, 3.6–3.7 mm wide when spread,

elliptic-sagittate in outline, lateral margins often recurved; lamina ca. 3 mm long, broadly rounded at distal margin, with apiculate top, lamellae 2.6–2.8 long, 0.2–0.3 mm high, 0.2–0.4 mm thick, parallel, vanishing below apex, rift between lamellae very narrow; auricles ca. 3 mm long, 1.7–1.8 mm wide, sinuate, semioblanceolate, subparallel, acute at apices. Gynostemium 1–1.2 mm long, 0.5–0.8 mm wide, erect; column pale greenish, above half of its length with cone-like, appendage, 0.2–0.3 mm long, 0.25–0.35 mm wide at base; staminodes 0.4–0.6 mm long, 0.3–0.4 mm wide, oblong, obliquely truncate at apex, distinctly bent backward, entire apical part blue-green; anther 0.3–0.4 mm long, 0.4–0.5 mm wide.

This species is distinguished by the minute size, characteristic habit, and slightly pendant inflorescence (Schlechter 1914).

DISTRIBUTION: New Guinea, known only from type collection. Alt. 1000 m.

HABITAT ECOLOGY: Epiphytic, on slender tree-trunks in forest; flowering in March.

***Pseudoliparis curviauriculata* Szlach. & Marg. (Fig. 5)**

Adansonia ser. 3, 21(2): 279. 1999.

TYPE: Indonesia. New Guinea, Vogelkop Peninsula. Aifat River Valley, N slope of the Eastern part of Tohkiri Ran, path Sururem–Timum, *van Royen & Sleumer 6916* (holotype L!).

Plant 22–26 cm tall, in compact clusters. Rhizome 2.5–3 mm diam., strongly abbrevi-

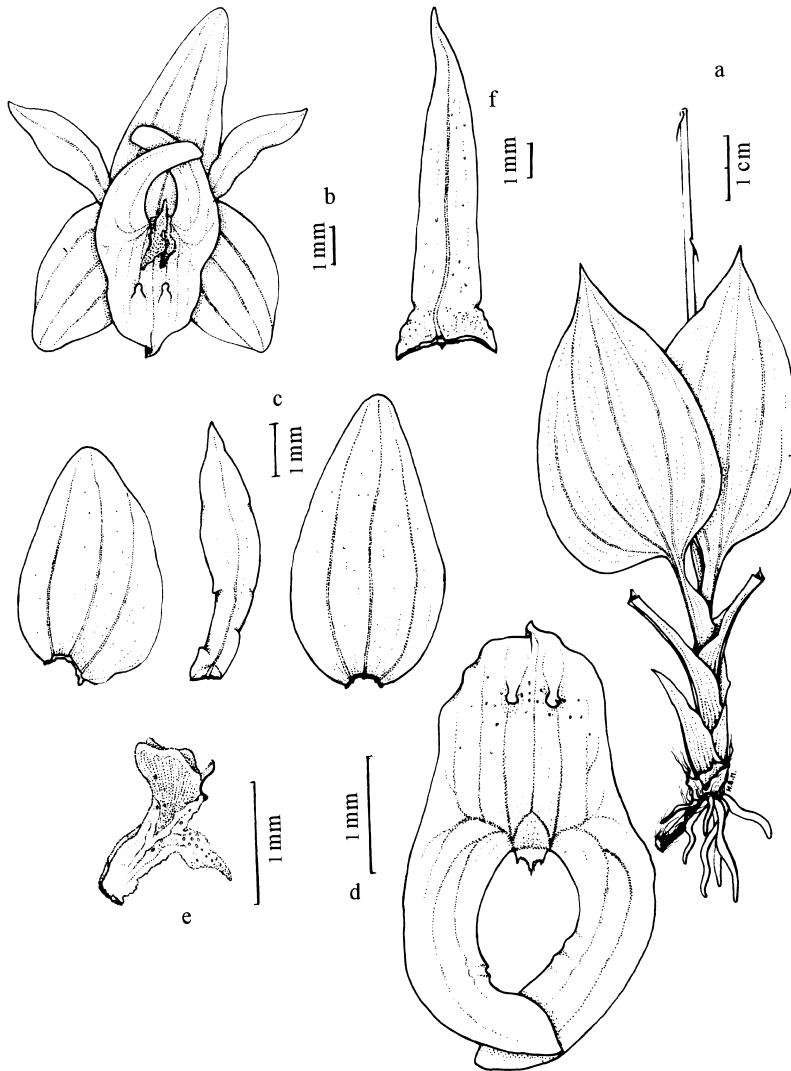


Fig. 5. *Pseudoliparis curvauriculata* (from holotype). — a: Plant. — b: Flower. — c: Tepals. — d: Lip. — e: Gynostemium, side view. — f: Floral bract.

ated, with loose node scales. Leafy stem 2.2–2.7 cm long, 0.2–0.3 cm diam., erect, abbreviated, fusiform, completely covered by leaf petioles and sheaths. Leaves 2–5; leaf petiole 0.8–1.5 cm long, 0.3–0.5 cm wide when spread; leaf sheath 0.6–1.4 cm long, 0.3–0.64 cm diam., green, fawn-tinged; leaf blade 2.5–7 cm long, 1–3.7 cm wide, broadly ovate to ovate, attenuate, apiculate at apex, slightly obcordate at base, 3–5-nerved, yellowish-green above, paler beneath. Inflorescence 20–23 cm long, distinctly elongate; raceme 7.7–8.2 cm tall, ca. 80-flowered, dense; peduncle rather gracile. Sterile bracts up to 3, 6–8 mm long, 1.5–1.7 mm wide, narrowly triangular, attenuate, acute at apex, 1-nerved,

reflexed. Floral bracts 4–6 mm long, 2–2.2 mm wide, longly triangular, attenuate, acute at apex, 1-nerved, deflexed, green. Ovary ca. 4 mm long, 0.8–1.2 mm diam.; pedicel 6–7 mm long, 0.5–0.8 mm diam.; sinuate, green to greenish-yellow. Flowers 7–10 mm diam., sordidly yellow. Sepals obtuse to rounded at apex. Dorsal sepal ca. 6 mm long, 2–2.2 mm wide, oblong-ovate. Lateral sepals ca. 4 mm long, 2.3–2.5 mm wide, obliquely ovate, slightly obcordate at base. Petals 4.4–5 mm long, ca. 1 mm wide, falcately curved, oblanceolate, attenuate, acute at apex. Lip ca. 5 mm long, 3–3.3 mm wide, hippocrepiiform; mid-lobe oblong, apiculate at apex, separated from lateral lobes by shallow indentation;

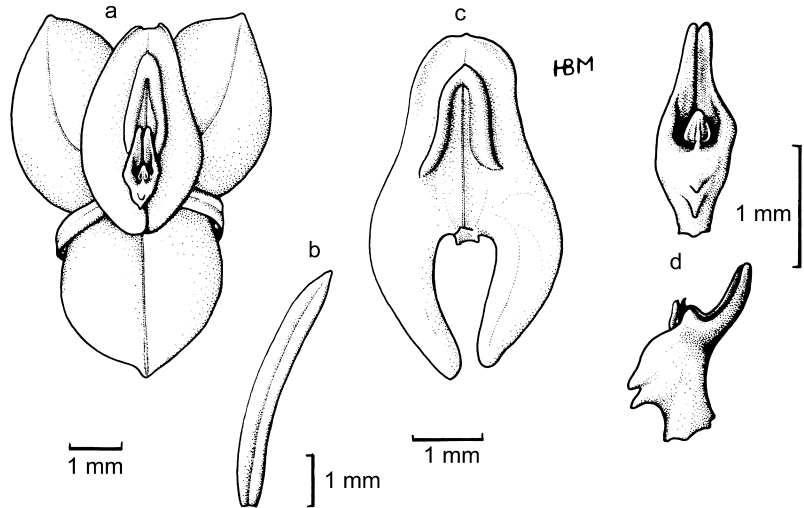


Fig. 6. *Pseudoliparis diploceras* (from original diagnosis and illustration). — a: Flower. — b: Petal. — c: Lip. — d: Gynostemium, side and front view.

lamina without lamellae, flat, with two characteristic, geminate, clavate, yellowish calli, each up to 1 mm high, 0.7–0.8 mm diam. at apex; auricles of lateral lobes ca. 2.5 mm long, 0.9–1.2 mm wide at base, oblong, nearly linear, subacute and distinctly crossing at apices. Gynostemium 2.2–2.4 mm long, 0.6–1 mm wide, erect, entire surface distinctly and minutely papillose; column pale-yellow to greenish-yellow, in about half of its length with large, erect, oblong-ovate, longly attenuate appendage, 0.8–1.2 mm long, ca. 0.8 mm wide about base; staminodes 0.8–0.9 mm long, 0.7–1 mm wide, nearly rectangular, obliquely truncate at apex, folded back from anther, dark-green; anther ca. 0.6 mm long, ca. 0.4 mm wide, pale-yellow to white-yellow; rostellum sinuately curved, greenish to dark-green.

This species is easily distinguished by the characteristic shape of petals and lip, and especially by the gynostemium and lip ornamentation.

DISTRIBUTION: New Guinea, known only from type collection. Alt. 800 m.

HABITAT ECOLOGY: Terrestrial, in *Castanopsis acuminatissima* forest, on bright grey clay; flowering in October.

***Pseudoliparis diploceras* (Schltr.) Szlach. & Marg. (Fig. 6)**

Adansonia ser. 3, 21(2): 276. 1999. — *Microstylis diploceras* Schltr., Reper. Spec. Nov. Reg. Veg., Beih. 1: 118. [1911]

1914. — *Malaxis diploceras* (Schltr.) Hunt, Kew Bull. 24: 78. 1970. — *Crepidium diploceras* (Schltr.) Szlach., Fragm. Flor. Geobot., Suppl. 3: 126. 1995. — **TYPE:** Papua New Guinea, Kaiser-Wilhelms-Land, Kani Range (Madang Distr.), *Schlechter 17228* (holotype B+).

Plant 8–12 cm tall, erect. Rhizome strongly abbreviated. Leafy stem 1–1.8 cm long, 0.7–1 cm diam., ovate, covered by leaf petioles and sheaths. Leaves ca. 6; leaf petiole widening towards base into sheath, erect; leaf blade 4–8 cm long, 0.8–1.4 cm wide, oblanceolate-elliptic, attenuate, apiculate, basally narrow to nearly cuneate, 3-nerved. Inflorescence 7–10 cm long; raceme 4–8-flowered, sublax. Sterile bract ca. 0.5 mm long, ovate-lanceolate, acuminate at apex, 1-nerved. Floral bracts 0.3–0.5 mm long, ovate-lanceolate, acuminate at apex, 1-nerved. Ovary and pedicel ca. 0.5 mm long. Flowers 0.8–1 cm diam., yellow with orange-yellow lip. Dorsal sepal ca. 5 mm long, ca. 3.6 mm wide, nearly elliptic, obtuse to subacute at apex, main nerve more distinct. Lateral sepals ca. 4 mm long, 2.6–2.7 mm wide, oblique, broadly elliptic, subapiculate at apex, main nerve more prominent. Petals ca. 5 mm long, 0.6–0.7 mm wide, linear, obtuse at apex, commonly bent backwards. Lip ca. 4.5 mm long, ca. 2.5 mm wide, sagittate, widest slightly above of its base; lamina ca. 3 mm long; mid-lobe oblong, semi-orbicular at distal part, with a subapiculate tip, separated from lateral lobes by a shallow indentation, lamella ca. 1.6 mm long, 0.2–0.3 mm

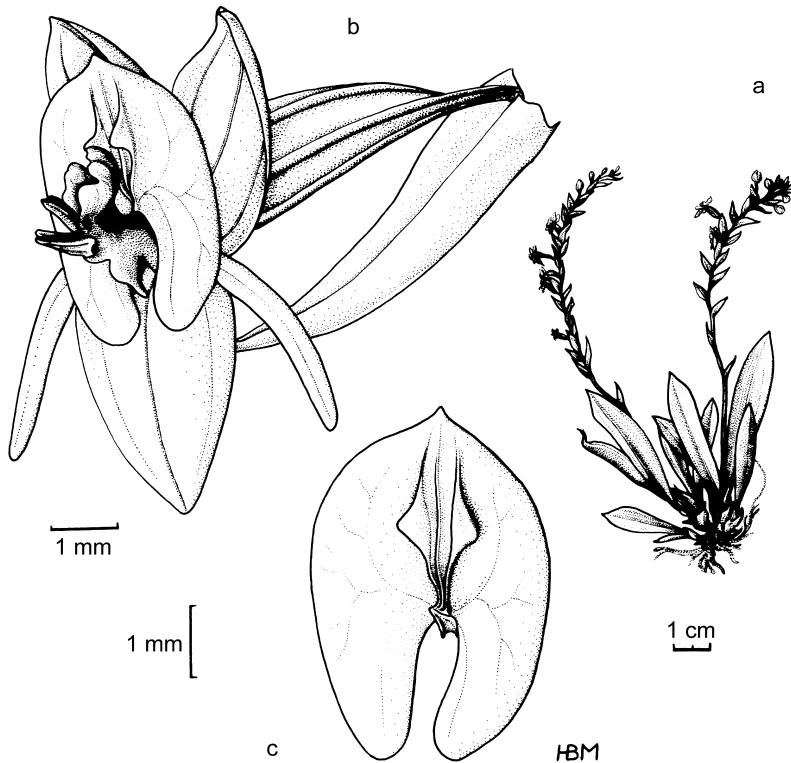


Fig. 7. *Pseudoliparis epiphytica* (a from Schlechter 14382, K; the others from Schlechter 18158, BM). — a: Plant. — b: Flower. — c: Lip.

wide, 0.1–0.3 mm high, lyriform; auricles of lateral lobes ca. 1.5 mm long, 0.9–1.2 mm wide at base, elongate, falcate, nearly linear, obtuse and touching at apices. Gynostemium 1.3–1.5 mm long, erect, dark blue-green; column in about half of its length with 2 horned appendages on dorsal surface; staminodes ca. 0.6 mm long, oblong, obliquely truncate at apex, strongly folded back from anther; anther 0.25–0.3 mm long, ovate to slightly obcordate.

This species is characterised by the habit, lip lamellae and particularly the 2-horned gynostemium appendage. It seems to be closely related to *Pseudoliparis epiphytica*, from which *P. diploceras* differs for example by the elliptic sepals, mid-lobe of lip being separated from lateral lobes by a distinct indentation, elongate and touching the lip auricles at apices.

DISTRIBUTION: New Guinea, rare, known from only one locality (type collection) and only a few specimens. Alt. 1100 m.

HABITAT ECOLOGY: Epiphyte, on trees, in forest; flowering in January.

Pseudoliparis epiphytica (Schltr.) Finet (Fig. 7)

Bull. Soc. Bot. France 54: 537. 1907. — *Microstylis epiphytica* Schltr., Nachtr. Fl. Deutsch. Schutzgeb.: 99. 1905. — *Crepidium epiphyticum* (Schltr.) Szlach., Fragm. Flor. Geobot., Suppl. 3: 126. 1995. — **TYPE:** Papua New Guinea, Kaiser-Wilhelms-Land, Torricelli Range (Sepik Distr.), Schlechter 18158 (holotype B+, isotype BM!, K!).

Plant 10–16 cm tall, erect, commonly clustered. Rhizome strongly abbreviated. Leafy stem 0.3–0.5 cm long, 0.2–0.3 cm diam., strongly abbreviated, oblong to ovate, completely covered by leaf petioles and sheaths. Leaves ca. 6; leaf petiole 0.2–0.5 cm long, 0.1–0.3 cm wide when spread, erect; leaf sheath 0.2–0.5 cm long, 0.2–0.4(0.5) cm diam., slightly inflated; leaf blade 4–8 cm long, 0.7–1.5 cm wide, lanceolate to oblanceolate, attenuate, acuminate at apex, basally narrow–nearly cuneate, 1–3-nerved, the middle nerve thicker and more distinct. Inflorescence 10–15 cm long; raceme 6.5–8.7 cm long, 20–30(40)-flowered, falcately curved, dense;

peduncle 3.5–6.4 cm long. Sterile bract usually 1, 7–11 mm long, 2–2.7 mm wide when spread, lanceolate, attenuate, acuminate at apex, 1-nerved, erect. Floral bracts 0.3–0.6 mm long, 1.4–2.4 mm wide, lanceolate, attenuate, acuminate at apex, 1-nerved, erect. Ovary and pedicel 0.6–1.2 cm long. Flowers 0.7–0.85 cm diam., tepals yellow-green, lip orange-red. Dorsal sepal 3.8–4.2 mm long, 2.9–3.2 mm wide, ovate, obtuse at apex, main nerve more distinct. Lateral sepals 3.7–4.1 mm long, 2.7–3 mm wide, oblique, ovate to oblong-ovate, obtuse to subapiculate at apex, main nerve more distinct. Petals 4–4.5 mm long, 0.5–0.7 mm wide, linear, obtuse at apex, commonly bent backwards. Lip 4.1–4.7 mm long, 2.5–3 mm wide, sagittate, the widest slightly above of its base; lamina 2.5–2.8 mm long; mid-lobe oblong, apiculate at distal tip, not separated from lateral lobes, lamellae 2, 1.7–2.2 mm long, 0.1–0.2 mm wide, 0.1–0.4 mm high, triangular in apical half, erect, parallel, along the main nerves of lip; auricles of lateral lobes 1.4–1.8 mm long, 1.1–1.4 mm wide at base, oblong, rounded at distal tip, parallel. Gynostemium 1.3–1.5 mm long, massive, erect, dark coloured, particularly in apical half; column in about half of its length with large appendage on the dorsal surface, appendages 0.6–0.8 mm high, elongate and obtuse at top; staminodes 0.8–1.1 mm long, 0.5–0.8 mm wide, nearly rectangular, obliquely truncate at apex, distal margin sinuate and curved, strongly folded back from the anther; anther 0.8–1 mm long, 0.4–0.5 mm wide, oblong-ovate; rostellum erect or slightly recurved. Fruit 0.7–0.9 mm long, 0.3–0.5 mm diam., oblong to oblong elliptic.

The species is easily distinguished by the characteristic shape of plants, lip lamella, and large gynostemium appendage. It seems to be closely related to *Pseudoliparis diploceras*, from which *P. epiphytica* differs for example by the flower shape, lip lamellae, and 1-horned gynostemium appendage.

DISTRIBUTION: New Guinea. Alt. 250–600 m.

HABITAT ECOLOGY: Epiphytic, on branches of shrubs or on trees in forest, in *Metroxylon* swamp (Smith 1909); flowering in April to May and in August to September.

REPRESENTATIVE SPECIMENS EXAMINED. — **Papua New Guinea.** Kaiser-Wilhelms-Land (Sepik Distr.), Garup River, *Schlechter 20348* (B+); West Sepik Province, Lumi District, Nauku Subdistrict, Torricelli Range (Mts), Ligan Pass, *Reeve 4075* (K, LAE). Cf.: **Indonesia.** New Guinea, Noord River, near Mundung and Reiger Rivers, *Versteeg 1154* (Smith 1909).

Pseudoliparis gregorii Marg. & Szlach. (Fig. 8)

Ann. Bot. Fennici 37: 279. 2000. — TYPE: Papua New Guinea. W part, valley of the lower Pami River, ca. 5 km N of Manokwari Div., *Koster BW 4379* (holotype L!).

Plant up to 41 cm tall, single. Rhizome 4–5.5 mm diam., with loose node scales. Leafy stem ca. 6.8 cm long, 0.5–0.7 cm diam., erect, fusiform, completely covered by leaf petioles and sheaths. Leaves 6; leaf petiole 1.8–3.3 cm long, 0.5–0.8 cm wide when spread; leaf sheath 1.5–2.8 cm long, 0.6–0.9 cm diam., green, fawn tinged; leaf blade 9.2–13.3 cm long, 3.2–4.9 cm wide, oblique, ovate to oblong-ovate, attenuate, acuminate at apex, 3–5-nerved, medium green, paler beneath. Inflorescence ca. 34.5 cm long, elongate with age; raceme ca. 17.2 cm tall, ca. 150-flowered, fairly dense in lower part, dense above; peduncle ca. 17.3 cm long. Sterile bracts few, 1–1.4 mm long, 2.6–3.2 mm wide, narrowly lanceolate, distinctly attenuate, acuminate at apex, 3-nerved, main nerve thicker and more distinct, reflexed. Floral bracts 3.5–5.5 mm long, 0.8–1.3(1.6) mm wide, linear to narrowly lanceolate, attenuate, acuminate at apex, 3-nerved, main nerve thicker and more distinct, reflexed. Ovary 3–5 mm long, 0.5–1.2 mm diam.; pedicel 3.5–5 mm long, 0.3–0.4(0.5) mm diam.; green to greenish-yellow. Flowers 4.8–5.6 mm diam., yellow. Dorsal sepal 3.2–3.5 mm long, 1.5–2 mm wide, oblong-ovate, elongate in apical half, apiculate at apex, slightly obcordate at base. Lateral sepals 2.8–3 mm long, 1.8–2.2 mm wide, obliquely ovate, apiculate at apex, obcordate at base, sometimes with wavy margins. Petals 3.2–3.4 mm long, 0.8–0.9 mm wide, slightly falcate, oblanceolate, straightly attenuate, acute at apex, longly cuneate at base. Lip 3.3–3.6 mm long, 3–3.4 mm wide, obscurely orbicular in general

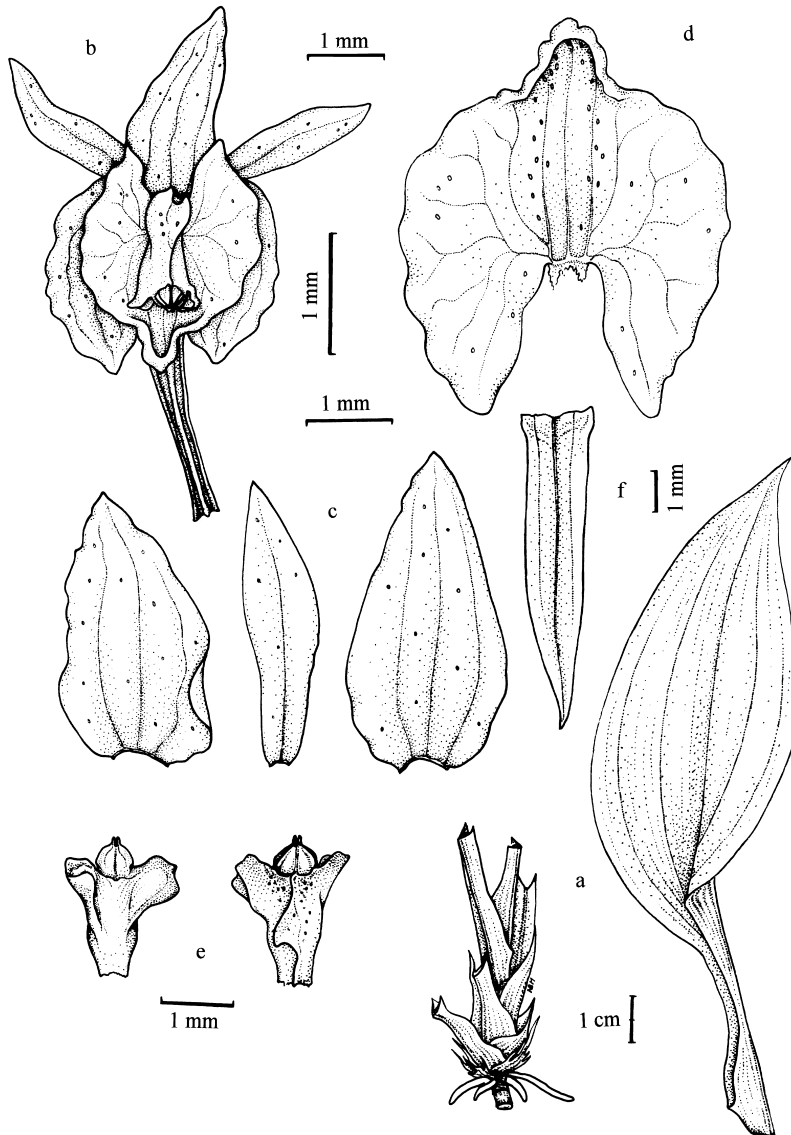


Fig. 8. *Pseudoliparis gregorii* (from holotype). — **a**: Base of plant and leaf. — **b**: Flower. — **c**: Tepals. — **d**: Lip. — **e**: Gynostemium, front and back view. — **f**: Floral bract.

outline; mid-lobe 0.7–0.9 mm long, 0.8–1 mm wide at base, nearly semiorbicular, rounded at top, margins reflexed and plicate, separated from lateral lobes by distinct indentation; lamina flat, only at middle strip slightly concave; lateral lobes auriculated: 1.2–1.5 mm long, 1–1.3 mm wide at base, falcate, nearly triangular, obtuse at apices, subparallel. Gynostemium 2–2.2 mm long, 1–1.5 mm wide, erect, with greenish tint in apical half; column in about half of its length with large, falcate, flat, curved down appendage 0.7–0.8 mm long, 0.4–0.6 mm wide at base; staminodes (0.5)0.6–0.7 mm long, ca. 0.3 mm

wide, shorter than anther, rectangular, truncate at apices, slightly folded back from anther; anther ca. 0.5 mm long and wide, pale, white-yellow to white-green; rostellum with two, small tips at distal margin, greenish. Fruit 8–11 mm long, 4–6 mm diam., oblong-obovate, fawn to yellowish.

The characteristic form of lip and gynostemium make this species easily distinguishable.

DISTRIBUTION: New Guinea, known only from type collection. Alt. ca. 40 m.

HABITAT ECOLOGY: Terrestrial; on clayey soil, with layers of humus and leaf litter; in primary forest; flowering in August.

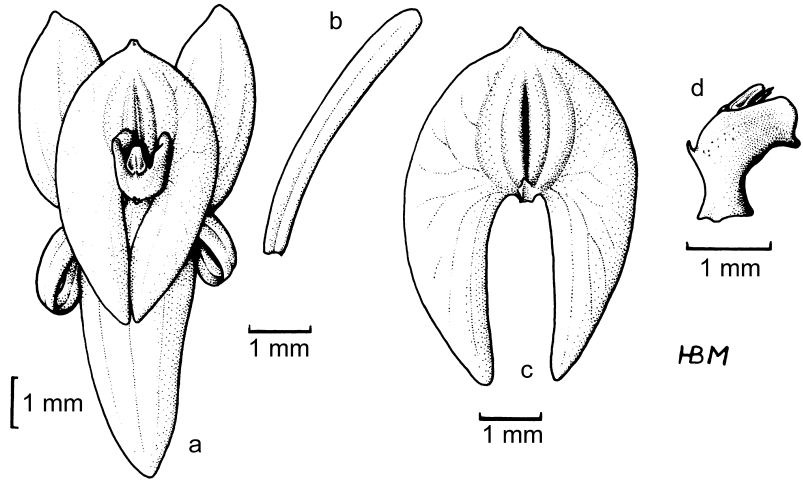


Fig. 9. *Pseudoliparis incurva* (from original diagnosis and illustration). — **a:** Flower. — **b:** Petal. — **c:** Lip. — **d:** Gynostemium, side view.

***Pseudoliparis incurva* (J.J. Sm.) Szlach. & Marg. (Fig. 9)**

Adansonia ser. 3, 21(2): 277. 1999. — *Microstylis incurva* J.J. Sm., Bull. Dep. Agr. Ind. Neerl. 19: 29. 1908. — *Malaxis incurva* (J.J. Sm.) Ames & C. Schweinf., *Orchidaceae* 6: 73. 1920. — *Crepidium incurvum* (J.J. Sm.) Szlach., *Fragm. Flor. Geobot.*, Suppl. 3: 127. 1995. — TYPE: Indonesia. New Guinea, near Nord River, Bivak Island, *Versteeg 1070* (holotype BO, BO-spirit. coll.).

Plant about 30 cm tall, erect. Leafy stem 7–8 cm long, fusiform, tenuous, covered by leaf petioles and sheaths, rooted at base. Leaves ca. 7; leaf petiole and sheath 2–3 cm long, erect; leaf blade 6.5–7.5 cm long, 2.5–2.7 cm wide, oblique, oblong-ovate, attenuate, acuminate at apex, undulate at margins, 5-nerved. Inflorescence about 23 cm long, elongate; raceme many-flowered, dense; peduncle 11–13 cm long. Sterile bract usually few, elongate, linear, attenuate, acuminate at apex, 1-nerved, erect. Floral bracts ca. 4.7 mm long, linear, acuminate at apex, 1-nerved, recurved. Ovary ca. 3.5 mm long; pedicel ca. 0.5 mm long; sinuate. Flowers about 9.25 mm long and 4.7 mm wide, orange-yellow, lip darker. Dorsal sepal ca. 5.75 mm long, ca. 2.7 mm wide, oblong-ovate, obtuse at apex, slightly convexed. Lateral sepals ca. 4 mm long, 2.7 mm wide, oblique, ovate, obtuse at apex, slightly obcordate at base, somewhat convexed. Petals ca. 4.7 mm long, ca. 0.7 mm wide, linear, obtuse at apex, commonly reflexed. Lip ca. 6 mm long, ca. 4.3 mm wide, elliptic

in outline, widest at its base; lamina ca. 3 mm long, semiorbicular in distal part, with apiculate and reflexed tip, lamellae 2.7–2.9 mm long, ca. 0.3 mm high, ca. 0.4 mm thick, simple, parallel, between them smooth, shallowly concaved strip of lamina; auricles ca. 3 mm long, 1.8–2 mm wide, elongate triangular, somewhat falcate, obtuse at apices, subparallel. Gynostemium ca. 1.75 mm long, 0.4–0.6 mm wide, entire arcuately recurved, black-brown, paler coloured near base; column in upper half with small, erect, distinctly turned-up, conelike appendage ca. 0.2 mm long, 0.1–0.15 mm wide at base; staminodes ca. 0.75 mm long, 0.5–0.6 mm wide, abbreviate, similar length to anther, simply truncate at apices, distinctly folded back from anther, darker coloured; anther 0.5–0.6 mm long, 0.3–0.4 mm wide, pale, white-yellow to white-green; rostellum ca. 0.5 mm long, triangular, rounded at apex, erect. Fruit ca. 8.5 mm long, ca. 6 mm diam., oblong clavate, middle green to fawn; pedicel 4–5 mm long.

Characteristic features of *Pseudoliparis incurva* are among others the obtuse tepals, simply linear petals, rounded distal margin of lip, with distinct apiculate and reflexed top, recurved gynostemium with simply truncate staminodes and a minute, turned-up appendage.

DISTRIBUTION: New Guinea, known only from type collection. Alt. ca. 450 m.

HABITAT ECOLOGY: Terrestrial, in *Metroxylon* swamp; flowering in May.

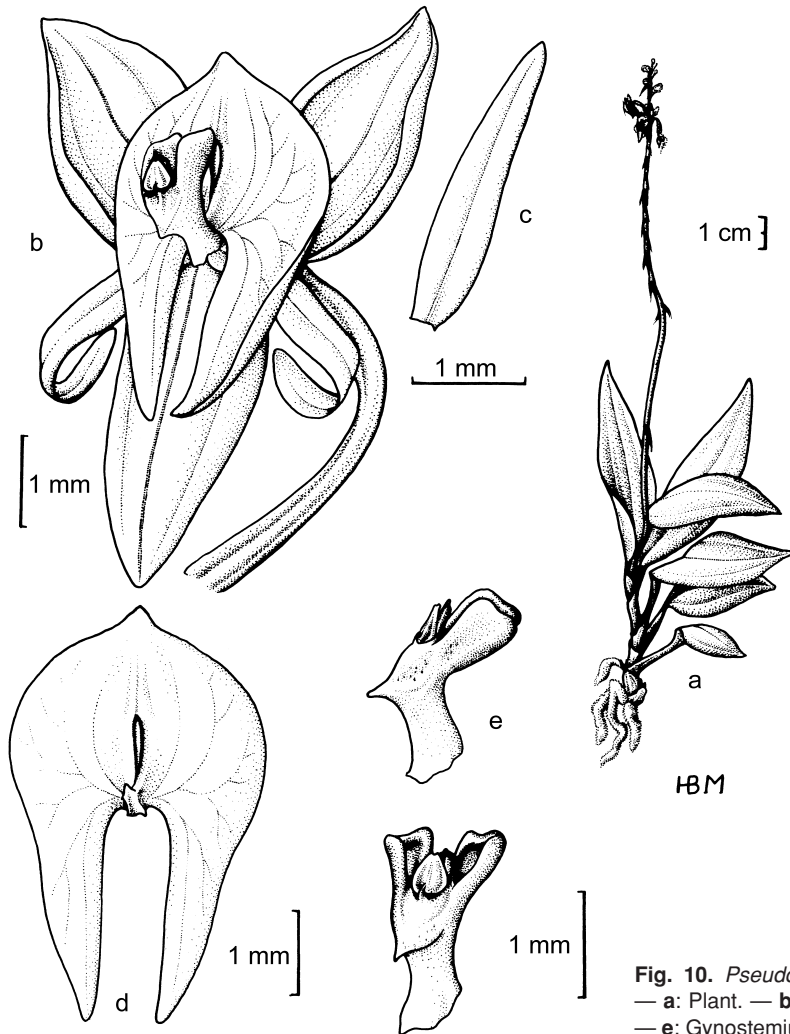


Fig. 10. *Pseudoliparis laevis* (from lectotype). — a: Plant. — b: Flower. — c: Petal. — d: Lip. — e: Gynostemium, side and front view.

***Pseudoliparis laevis* (Schltr.) Szlach. & Marg. (Fig. 10)**

Adansonia ser. 3, 21(2): 277. 1999. — *Microstylis laevis* Schltr., Repert. Spec. Nov. Reg. Veg., Beih. 1: 112. [1911] 1914. — *Malaxis laevis* (Schltr.) Hunt, Kew Bull. 24: 78. 1970. — *Crepidium laevis* (Schltr.) Szlach., Fragm. Flor. Geobot., Suppl. 3: 128. 1995. — LECTOTYPE (here designated): Papua New Guinea, Kaiser-Wilhelms-Land, Kani Range (Madang Distr.), *Schlechter 19142* (L!, isoelectotypes B+, BO), *Schlechter 17131* (syntype B+).

Plant 18–30 cm tall, slender, erect. Rhizome strongly abbreviated, node scales loose. Leafy stem ca. 2.5 cm long, 0.3–0.55 cm diam., fusiform, green, nearly completely covered by leaf petioles and sheaths. Leaves 4–6; leaf petiole

(0.4)0.8–1.2(1.7) cm long, 0.2–0.6 cm wide when spread, erect, green with grey tint; leaf sheath (0.8)1.5–2.5(2.8) cm long, 0.35–0.7 cm diam., dark-green, younger paler; leaf blade (2.2)3.5–6(7) cm long, (1.2)1.7–2.4 cm wide, oblique, ovate, oblong-ovate to lanceolate, attenuate, acuminate at apex, 3–5-nerved, dark-green above, paler grey-green beneath. Inflorescence up to 16.5 cm long, gracile; raceme up to 7 cm long, 10–20-flowered, sublax, rather delicate; peduncle 8–10 cm long, light green. Sterile bract usually 1, 5–7 mm long, 0.8–1.2 mm wide, lanceolate, attenuate, acuminate at apex, 1-nerved, erect. Floral bracts 2.5–4.8 mm long, 0.6–0.8 mm wide, lanceolate, acuminate at apex, 1-nerved, recurved. Ovary ca. 2 mm

long, 0.6–0.8(1) mm diam.; pedicel ca. 5 mm long, 0.4–0.5 mm diam.; sinuate, green. Flowers about 6.5–7 mm long, 4–5 mm wide, yellowish, lip orange yellow with distinctly dark-green lamellae. Dorsal sepal 3.8–5.5 mm long, 1.6–2.3 mm wide, oblong to oblong-ovate, obtuse at apex. Lateral sepals 3.5–4 mm long, 2–2.4 mm wide, oblique, broadly ovate to ovate, obtuse to subacute at apex, slightly obcordate at base. Petals 3.7–4 mm long, 0.7–0.8 mm wide, gently oblique, linear-lanceolate, obtuse at apex, commonly bent backwards. Lip ca. 5 mm long, 2–2.2 mm wide, sagittate, widest about half of lamina length, margins often incurved; lamina 2.2–2.5 mm long, transversally elliptic, broadly rounded in distal part, distinctly apiculate at top (0.4–0.5 mm long, 0.4–0.5 mm wide at base), lamellae 0.8–1 mm long, 0.1–0.2 mm high, 0.1–0.2 mm thick, simple, delicate, parallel, vanishing slightly above half of lamina length, distinctly darker coloured, particularly at distal margins, lamina between lamellae flat and narrow, basal callus 0.4–0.5 mm long, 0.3–0.4 mm high, ca. 0.1 mm thick; auricles 2.5–3 mm long, 1.2–1.6 mm wide, elongate, oblique-oblancoate, obtuse at apices, prominently erect, parallel. Gynostemium 1.6–2 mm long, 0.4–0.6 mm wide, erect, entire surface very minutely papillose; column distinctly recurved in apical half, pale-yellow-greenish, above half of its length with distinct, strongly erect, conelike, longly attenuate in apical part appendage ca. 0.2 mm long, 0.4–0.6 mm wide at base; staminodes ca. 0.8 mm long, 0.4–0.6 mm wide, 0.1–0.2 mm thick, oblong, slightly cuneate, simply truncate at apex, subparallel to anther, dark-green to blue-green; anther 0.5–0.6 mm long, 0.4–0.5 mm wide, pale greenish yellow to white-green; rostellum dark-green to blue-green.

This species differs easily from the congeners by the lip shape, its delicate lamellae, prominent auricles, and also by the shape and colour of the recurved gynostemium.

DISTRIBUTION: New Guinea, known only from type collection. Alt. 1100–1200 m.

HABITAT ECOLOGY: Terrestrial; on humus covered by layer of leaf litter; in wet and shady places, in primary forest; occurring in small groups of a few specimens or singly; flowering in January.

***Pseudoliparis macrotis* (Kraenzl.) Szlach. & Marg.**

Adansonia ser. 3, 21(2): 277. 1999. — *Liparis macrotis* Kraenzl., Schuman & Lauterbach, Nachtr. Fl. Deutsch. Schutzgeb.: 104. 1905. — *Microstylis macrotis* (Kraenzl.) Schltr., Repert. Spec. Nov. Reg. Veg., Beih. 1: 113. [1911] 1914. — *Malaxis macrotis* (Kraenzl.) Hunt, Kew Bull. 24: 78. 1970. — *Crepidium macrotis* (Kraenzl.) Szlach., Fragm. Flor. Geobot., Suppl. 3: 128. 1995. — **TYPE:** Papua New Guinea, Kaiser-Wilhelms-Land, East coast (Morobe Distr.), near mouth of Bubui River, Simbag, *Nymann 789* (holotype B+).

Plant ca. 25 cm tall, erect. Rhizome abbreviated. Leafy stem 1–3 cm long, fusiform, covered by leaf petioles and sheaths. Leaves 5–6; leaf petiole 0.6–1.2 cm long, erect; leaf sheath 0.4–0.8 cm long, green; leaf blade 3–6 cm long, 2–5 cm wide, oblique, ovate to oblong-ovate, attenuate, acute at apex, 3-nerved, shiny green above, paler, grey-green beneath. Inflorescence 20–22 cm long; raceme subdense, gracile. Sterile bract usually 1, lanceolate, acuminate at apex, 1-nerved. Floral bracts lanceolate, acuminate at apex, 1-nerved, recurved. Flowers ca. 4 mm long, 3.5–4 mm wide, pale blackish-brown. Dorsal sepal 2–2.2 mm long, 0.9–1.1 mm wide, ovate to oblong-ovate, acute at apex. Lateral sepals 1.8–2 mm long, 1.1–1.3 mm wide, oblique, oblong-ovate, obtuse to subacute at apex, slightly obcordate at base. Petals 1.5–1.7 mm long, ca. 0.5 mm wide, linear, obtuse to retuse at apex, commonly bent backwards. Lip 2–2.2 mm long, ca. 2 mm wide, sagittate to nearly trapezoid; lamina semi-orbicular in distal part, obtuse at top, lamellae simple, parallel, darker coloured, particularly at distal margins, lamina between lamellae flat and narrow; auricles elongate, oblique oblancoate, subacute at apices, subparallel, erect or slightly reflexed. Gynostemium 1–1.2 mm long, 0.4–0.5 mm wide, distinctly recurved, at apical part dark-green; column pale greenish-yellow, about half of its length with erect, broad, obtuse at top, conelike appendage; staminodes 0.4–0.6 mm long, 0.25–0.32 mm wide, oblong, obliquely truncate at apex, folded back from anther, darker coloured; anther 0.3–0.4 mm long, 0.2–0.3 mm wide, pale greenish yellow to white-green; rostellum erect, greenish to dark-green.

This species is similar to *Pseudoliparis laevis* in habit, but close to *P. umbonata* in morphol-

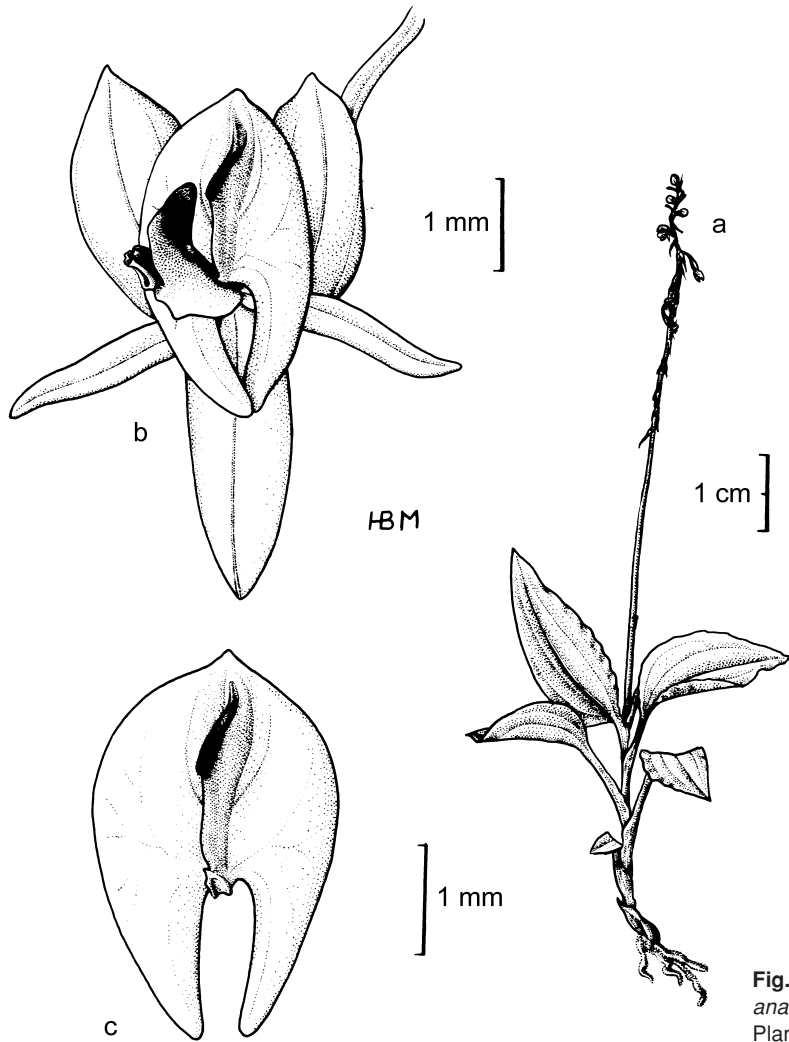


Fig. 11. *Pseudoliparis schumanniana* (from Reeve 2145, K). — a: Plant. — b: Flower. — c: Lip.

ogy of flower (Schlechter 1914). The leaves of *Pseudoliparis macrotis* are broad, ovate, the lateral sepals are oblong-ovate, obtuse at apex, slightly obcordate at base, whereas the petals are linear. The gynostemium appendage is short and conelike.

DISTRIBUTION: New Guinea. Endemic. Alt.: 50–600 m.

HABITAT ECOLOGY: Terrestrial; in humus, covered by layer of leaf litter; in monsoon forest; flowering in July and August.

REPRESENTATIVE SPECIMEN EXAMINED. — **Papua New Guinea**. Kaiser-Wilhelms-Land, East coast (Morobe Distr.), Sattelberg Mt., *Schlechter 19961* (B+).

Pseudoliparis schumanniana (Schltr.) Szlach. & Marg. (Fig. 11)

Adansonia ser. 3, 21(2): 277. 1999. — *Microstylis schumanniana* Schltr., Nachtr. Fl. Deutsch. Schutzgeb.: 101. 1905. — *Malaxis schumanniana* (Schltr.) Hunt, Kew Bull. 24: 84. 1970. — *Crepidium schumannianum* (Schltr.) Szlach., Fragm. Flor. Geobot., Suppl. 3: 131. 1995. — TYPE: Papua New Guinea. Kaiser-Wilhelms-Land, Bismarck Mountains Range (Madang Distr.), *Schlechter 14058* (holotype B+).

Plant small, about 10 cm tall, erect, sometimes few in cluster. Rhizome strongly abbreviated. Leafy stem 1.1–2 cm long, 0.1–0.26 cm diam., completely covered by leaf petioles and sheaths. Leaves 3–5; leaf petiole 0.5–1.1 cm

long, 0.12–0.4 cm wide when spread, green; leaf sheath 0.6–1.3 mm long, 0.1–0.3 cm diam., paler near base; leaf blade 1.2–3.2 cm long, 0.5–1.6 cm wide, slightly oblique, ovate, attenuate, acuminate at apex, slightly obcordate at base, margins partly undulate, 3-nerved, green. Inflorescence 8–9.5 cm long; raceme 2.5–4 mm long, 10–25-flowered, subdense to dense; peduncle ca. 5.5 mm long, gracile. Sterile bract usual 1, 3.5–4.2 mm long, 1–1.3 mm wide, lanceolate, attenuate, acuminate at apex, 1-nerved, often reflexed. Floral bracts 1.8–3.6 mm long, 0.5–1 mm wide, lanceolate, acuminate at apex, 1-nerved, reflexed. Flowers 5.7–6 mm long, 4.5–5 mm wide when spread, greenish yellow (younger) to cream-yellow (older), lip darker coloured, particularly at central part and its calli. Dorsal sepal 3–3.2 mm long, 1–1.2 mm wide, ovate to oblong-ovate, obtuse at apex, usually 1-nerved. Lateral sepals 2.5–2.7 mm long, 1.6–1.8 mm wide, oblique ovate, obtuse to subacute at apex, slightly obcordate at base, 3-nerved, middle nerve more distinct. Petals 2.4–2.6 mm long, 0.4–0.5 mm wide, linear, subacute at apex, usually strongly bent backwards. Lip 3.2–3.7 mm long, 2–2.2 mm wide when spread, obovate-sagittate in outline; lamina 2–2.1 mm long, reniform, distinctly apiculate at tip, lamellae 0.8–1 long, 0.1–0.6 mm high, ca. 0.1 mm thick, simple, parallel, between them thin rift, lamellae convergent together distinctly below top of lamina, and down connected together in basal callus ca. 0.8 mm high; auricles 1.4–1.8 mm long, 0.8–1 mm wide, elongate, falcately triangular, obtuse to subacute and nearly touching at apices. Gynostemium ca. 1–1.3 mm long, 0.5–0.9 mm wide, erect; column pale greenish-yellow, above half length with relatively short, erect, conelike, acute at tip appendage 0.05–0.12 mm long, 0.2–0.3 mm wide at base; staminodes 0.7–0.9 mm long, 0.4–0.5 mm wide, oblong, obliquely truncate at apices, folded back from anther, darker coloured; anther ca. 0.4 mm long, ca. 0.3 mm wide, pale greenish yellow to white-green; rostellum dark coloured.

This rare and minute species is characterized by a 1-nerved dorsal sepal, thick main nerves of lateral sepals, and the characteristic shape of lip lamellae and gynostemium.

DISTRIBUTION: New Guinea, probably endemic. Alt. 1400–1800 m.

HABITAT ECOLOGY: Terrestrial; on humus, covered by layer of leaf litter; in mountain forest; flowering in January and April.

REPRESENTATIVE SPECIMEN EXAMINED. — **Papua New Guinea.** Southern Highland Prov., Kagua Distr., Erave Subdistr., Batri, Kinita ridge, *Reeve 2145* (K).

***Pseudoliparis seleniglossa* (Schltr.) Szlach. & Marg. (Fig. 12)**

Adansonia ser. 3, 21(2): 277. 1999. — *Microstylis seleniglossa* Schltr., *Repert. Spec. Nov. Regni. Veg., Beih.* 1: 115. 1914. — *Malaxis seleniglossa* (Schltr.) L.O. Williams, *Bot. Mus. Leaft. Harvard Univ.* 12: 156. 1946. — *Crepidium seleniglossum* (Schltr.) Szlach., *Fragm. Flor. Geobot., Suppl.* 3: 132. 1995. — TYPE: Papua New Guinea, Kaiser-Wilhelms-Land, the Finisterre Range (Madang Distr.), *Schlechter 18062* (B+).

Plant 8–15 cm tall, minute. Rhizome strongly abbreviated. Leafy stem brief, basally sheathed. Leaves 4–7; leaf petiole 0.5–1 cm long, sheathing at bases; leaf blade 2.5–5.5 cm long, 0.8–1.5 cm wide, narrow, strongly obliquely lanceolate, acuminate at apex, subcuneate basally, green, paler beneath. Inflorescence elongate; with raceme 5–20-flowered, subdense; peduncle longer than raceme. Floral bracts slightly longer than ovary and pedicel, lanceolate, acute at apex, 1-nerved, amplexicaul, recurved. Ovary and pedicel ca. 5 mm long. Flowers 5.7–5.9 mm long, 3.5–3.6 mm wide, green-yellow, with flushed pale brown lip. Dorsal sepal ca. 3 mm long, 1.3–1.4 mm wide, oblong elliptic, obtuse to subacute at apex. Lateral sepals 2.7–2.8 mm long, ca. 1.8 mm wide, oblique ovate, obtuse at apex. Petals ca. 3 mm long, ca. 0.45 mm wide, oblique linear, simple in outline, obtuse at apex. Lip ca. 4 mm long, ca. 2.5 mm wide, elliptic in outline, margins simply, in apical part laterally slightly reflexed; lamina 2 mm long, nearly semiorbicular in distal part, lamellae 1.8–1.9 mm long, 0.25–0.3 mm thick, simple, fleshy, subparallel, vanishing below apex of lamina, lamina between lamellae flat and narrow, basal connection of lamellae erect; auricles 1 mm long, elongate, semilunate, acute at apices, subparallel. Gynostemium erect, with

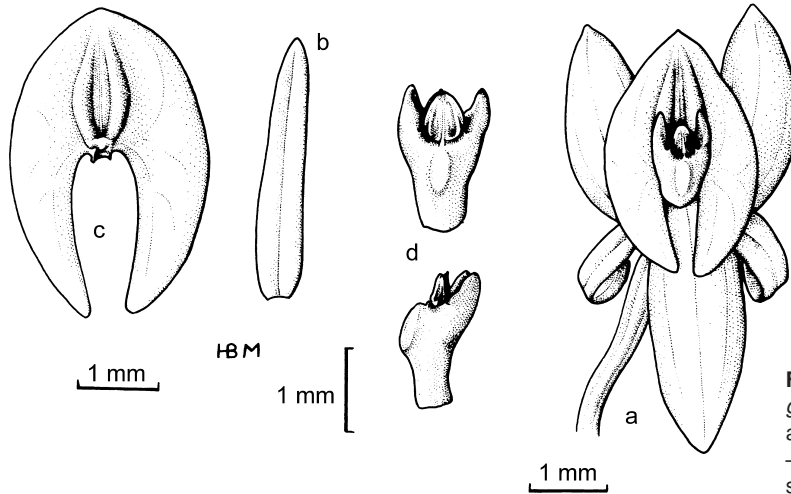


Fig. 12. *Pseudoliparis seleniglossa* (from original diagnosis and illustration). — a: Flower. — b: Petal. — c: Lip. — d: Gynostemium, front and side view.

dark-green-blue towards apex; column simple, below anther base, on dorsal surface with large appendage, apex of appendage distinctly truncate and flat; staminodes abbreviate, at most similar length to anther, obliquely contracting to apices, recurved; anther broadly ovate.

Pseudoliparis seleniglossa is easily distinguished by the simple form of lip and lamellae, and particularly by the truncate apex of gynostemium appendage.

DISTRIBUTION: New Guinea, known only from type collection. Alt. 1000 m.

HABITAT ECOLOGY: Epiphytic, on tree-trunks in forest; flowering in July.

***Pseudoliparis torricellensis* (Schltr.) Szlach. & Marg. (Fig. 13)**

Adansonia ser. 3, 21(2): 277. 1999. — *Microstylis torricellensis* Schltr., Repert. Spec. Nov. Regni. Veg., Beih. 1: 114–115. 1914. — *Malaxis torricellensis* (Schltr.) P.F. Hunt, Kew Bull. 24: 85. 1970. — *Crepidium torricellensis* (Schltr.) Szlach., Fragm. Flor. Geobot., Suppl. 3: 132. 1995. — TYPE: Papua New Guinea, Kaiser-Wilhelms-Land, Torricelli Range (Sepik Distr.), *Schlechter 20043* (holotype B+).

Plant 8–20(33) cm tall. Rhizome abbreviated. Leafy stem 0.8–5 cm long, 0.1–0.28 cm diam., fusiform, covered by leaf petioles and sheaths. Leaves (3)5–9; leaf petiole (0.4)0.7–1.2 cm long, 0.2–0.6 cm wide when spread, erect; leaf sheath (0.5)0.7–1 cm long, (0.18)0.2–0.6(0.8) cm diam., green; leaf blade (2)2.8–3.5(5.2) cm long, 1.4–

2(2.8) cm wide, oblique ovate or ovate-lanceolate, margins sometimes undulate, simply attenuate, acute or acuminate at apex, 3–5-nerved, green above, paler green beneath. Inflorescence 7–15 cm long, elongate with age up to 25(32) cm long; raceme 5–10 cm long when young, 17–23 cm long when fruiting, 10–70-flowered, subdense. Sterile bract usually 1(2–3), 5–10 mm long, 0.8–1.5 mm wide, lanceolate, attenuate, acuminate at apex, 1-nerved, recurved. Floral bracts 2.5–4.3 mm long, 0.5–0.8 mm wide, lanceolate, attenuate, acute at apex, 1-nerved, reflexed. Ovary 1–1.5(1.7) mm long, 0.5–0.7 mm diam.; pedicel 1.5–2.3 mm long, 0.3–0.4 mm diam.; sinuate, green to greenish-yellow. Flower 5–6 mm long, 3–3.5 mm wide; tepals green-yellow, sometimes with flesh tint and with darker nerves; lip olive to yellow-orange, lamellae darker. Dorsal sepal 3–3.5 mm long, 1.6–2 mm wide, ovate to oblong-ovate, obtuse at apex. Lateral sepals 2.2–2.5 mm long, 1.5–1.8 mm wide, oblique, broadly elliptic, obtuse at apex. Petals 2.8–3.5 mm long, ca. 0.5 mm wide, oblique linear, obtuse at apex. Lip 3.8–4 mm long, 1.7–2.5 mm wide, sagittate in outline, widest about base; lamina ca. 2 mm long, distal margin semiorbicular with apiculate top, lamellae 1.2–1.5 mm long, 0.2–0.3 mm high, 0.1–0.15 mm thick, simple, parallel, vanishing near apex of lamina; auricles 1.7–2 mm long, 0.8–1.1 mm wide, elongate, oblique oblanceolate, gently sinuate, obtuse to subacute at apices, nearly touching at apices. Gynostemium brief, erect, entire

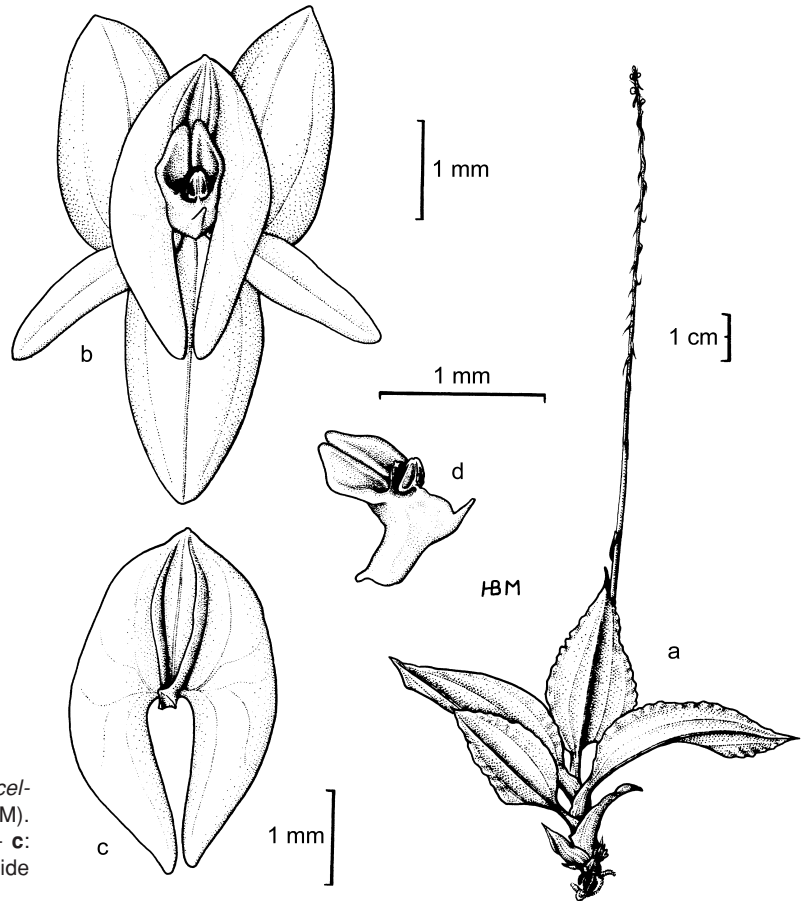


Fig. 13. *Pseudoliparis torricellensis* (from Carr 10094, L, BM). — **a:** Plant. — **b:** Flower. — **c:** Lip. — **d:** Gynostemium, side view.

surface very minutely papillose; column ca. 1 mm long, 0.4 (at base)–0.7 mm wide, recurved about 2/3 of its length, at dorsal surface of column large convexity (semiorbicular), with attenuate, erect and acute appendage 0.2–0.3 mm long, 0.2–0.3 mm wide at base, ca. 0.1 mm wide at distal portion, olive-green; staminodia 1–1.2 mm long, 0.4–0.5 mm broad, 0.1–0.2 mm thick, erect, deflexed back, obliquely contracting to apices, blue; anther ca. 0.4 mm long and wide, pale-greenish and bluish; rostellum dark coloured. Fruit 6–10 mm long, 0.25–0.4 mm diam., oblong-obovate, green to greenish fawn.

Although Carr's plants are terrestrial and larger, with longer inflorescences than Schlechter (1914) described for the species, the morphology of lip and gynostemium agree with the original diagnosis and illustrations of *Microstylis torricellensis*.

DISTRIBUTION: New Guinea. Alt. 450–600 m.

HABITAT ECOLOGY: Epiphytic, sometimes terrestrial; on tree-trunks in the forest, on humus covered by layer of leaf litter, under *Hevea*; flowering in June and September.

REPRESENTATIVE SPECIMEN EXAMINED. — Papua New Guinea. Koitaki, Carr 10094 (L, BM, SING).

***Pseudoliparis tubulosa* (J.J. Sm.) Szlach. & Marg. (Fig. 14)**

Adansonia ser. 3, 21(2): 277. 1999. — *Microstylis tubulosa* J.J. Sm., Bull. Dep. Agric. Ind. Neerl. 5: 1. 1907. — *Malaxis tubulosa* (J.J. Sm.) Ames, Orchidaceae 5: 68. 1915. — *Crepidium tubulosum* (J.J. Sm.) Szlach., Fragm. Flor. Geobot., Suppl. 3: 133. 1995. — TYPE: Indonesia. New Guinea, Sinagai Mountain, Exp. Wichmann, *Djiedja* 133, Cult. in Bog. Hort. Bot. (holotype BO).

Plant 20–42 cm tall, slender, and erect. Rhizome strongly abbreviated. Leafy stem 3.5–5

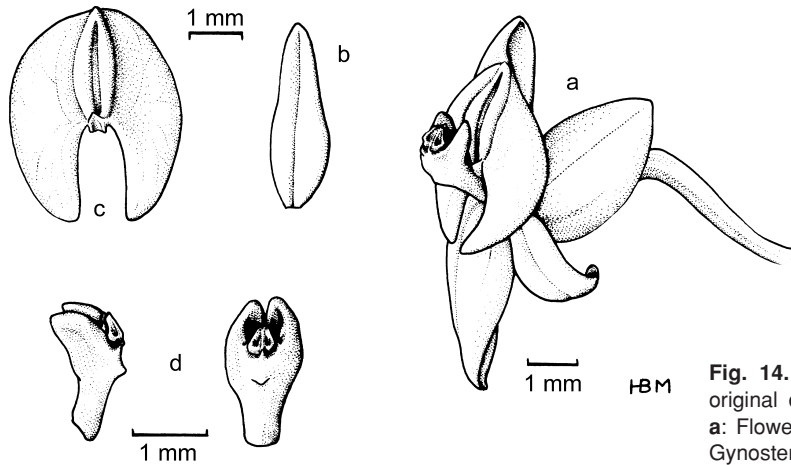


Fig. 14. *Pseudoliparis tubulosa* (from original diagnosis and illustrations). — a: Flower. — b: Petal. — c: Lip. — d: Gynostemium, front and lateral view.

cm long, 0.8–1 cm diam., fusiform, green, covered by leaf petioles and sheaths. Leaves ca. 5; leaf petiole 0.7–1.5 cm long, 0.5–1 cm wide when spread, erect, pale green; leaf sheath (0.8)1.5–2.5(2.8) cm long, 0.5–1.2 cm diam., pale greenish; leaf blade 4–12 cm long, 2.3–5 cm wide, oblique, oblong-ovate to broadly lanceolate, mucronate at apex, undulate at margins, 3–5-nerved, main nerves carinated beneath, blade green, paler grey-green beneath. Inflorescence 28–37 cm long; raceme about 20 cm long, many-flowered, dense; peduncle 12–17 cm long, bright green. Sterile bract usually 1, lanceolate, attenuate, acuminate at apex, 1-nerved, erect. Floral bracts 1.5–2.8 mm long, 0.4–0.8 mm wide, lanceolate, acuminate at apex, 1-nerved, recurved, green. Ovary ca. 2.7 mm long; pedicel ca. 5 mm long; sinuate, green to greenish-yellow. Flowers 6.5–7.8 mm long, 4–4.8 mm wide when spread, pale flavescent-green, lip pale olive-ochre to ochre, sometimes with violet tint. Dorsal sepal 4.2–4.6 mm long, 2.3–2.6 mm wide, oblong elliptic, convex, obtuse at apex. Lateral sepals 2.8–3 mm long, 2.3–2.6 mm wide, falcate, oblique ovate, minutely acute at apex, slightly obcordate at base. Petals 3.5–3.8 mm long, 1.1–1.3 mm wide, oblique, asymmetrically lanceolate, distinctly narrowed, nearly linear in apical half, obtuse to subacute at apex, erect or often bent backwards. Lip 3.8–4.2 mm long, 3.5–3.8 mm wide when spread, lip about orbicular to elliptic in outline, margins and apex recurved; lamina 1.9–2.2 mm long, top of lip nearly round, with simply, lamellae 0.2–0.35

mm high, 0.3–0.4 mm thick, parallel, stretch directly to lamina apex, lamina between lamellae flat and narrow; auricles 1.8–2 mm long, 1.1–1.3 mm wide, falcately triangular, obtuse at apices, subparallel. Gynostemium about 2 mm long, 0.5–1.2 mm wide, erect; column pale greenish-yellow, above half of column length with appendage ca. 0.2 mm long, 0.4–0.5 mm wide at base, abbreviate, conelike, erect; staminodes ca. 0.4 mm long, 0.4–0.5 mm wide, abbreviate, at most similar length to anther, oblong, with distal margins obliquely narrowed up to apices, folded back from anther, deeply green; anther 0.3–0.4 mm long, 0.25–0.35 mm wide, oblong obcordate, bright green, margins paler; rostellum abbreviate, triangular, obtuse at top. Fruit oblong-obovate, fawn to yellowish.

The most characteristic features of this species are the shape of petals, lip and gynostemium, particularly its staminodes. It seems to be closely related to *P. breviscapa* and *P. brachycaulos*, from which *P. tubulosa* differs mainly by the dorsal sepal being oblong-elliptic, entire lip ca. elliptic to orbicular, and with a nearly round tip of lip lamina.

DISTRIBUTION: New Guinea (Irian Jaya), probably endemic. Alt. ca. 1000 m.

HABITAT ECOLOGY: Terrestrial; on leaf litter on humus, in primary forest; flowering in June to July.

REPRESENTATIVE SPECIMENS EXAMINED. — **Indonesia.** North New Guinea, Cyclopen Mountains, 1911, *Gjellerup 503* (BO, BO-spirit. coll.); Jawia, *Gjellerup 620* (BO, BO-spirit. coll.); Rouffaer River, *Leeuwen 9795* (BO, BO-spirit.

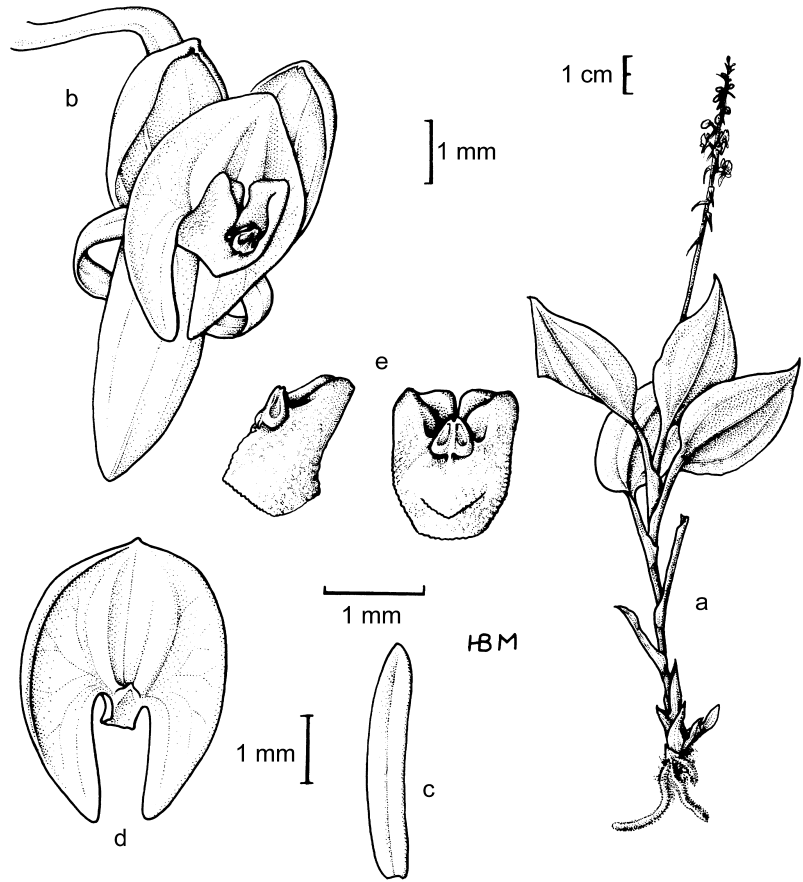


Fig. 15. *Pseudoliparis umbonata* (a from Reeve 3119, K; the others from Sands 20796, K-spirit. coll.). — a: Plant. — b: Flower. — c: Petal. — d: Lip. — e: Gynostemium, front and lateral view.

coll.); near Nord River, S of Geluks pass, 1907, *Versteeg 1399a* (BO-spirit. coll.).

***Pseudoliparis umbonata* (Schltr.) Szlach. & Marg. (Fig. 15)**

Adansonia ser. 3, 21(2): 277. 1999. — *Microstylis umbonata* Schltr., *Repert. Spec. Nov. Reg. Veg.*, Beih. 1: 113. [1911] 1914. — *Malaxis umbonata* (Schltr.) Hunt, *Kew Bull.* 24: 85. 1970. — *Crepidium umbonatum* (Schltr.) Szlach., *Fragm. Flor. Geobot.*, Suppl. 3: 133. 1995. — TYPE: Papua New Guinea, Kaiser-Wilhelms-Land, Bismarck Mountain Range (Madang Distr.), near Kenejia Base, *Schlechter 18631* (holotype B+).

Plant (10)15–27 cm tall, slender, often few in cluster. Rhizome abbreviated, creeping, node 2–5.3 mm long, 2.8–4 mm diam., internode 3.4–4.6 mm long, node scales lax. Leafy stem 1.5–3 cm long, 0.3–1 cm diam., erect to arising, olive-green to green, partly covered by leaf petioles and sheaths. Leaves 4–6; leaf petiole (0.3)0.5–

1.3 cm long, 0.2–0.6 cm wide when spread, erect; leaf sheath (0.4)0.7–1.7 cm long, 0.4–1.2 cm diam., paler green, often with bluish grey tint; leaf blade (1.2)3.5–5 cm long, (0.8)1.5–2 cm wide, oblique, elliptic, attenuate, apiculate to acuminate at apex, cuneate to nearly obcordate at base, 3–5-nerved, green above, paler to bluish grey-green beneath. Inflorescence 10–14 cm long; raceme 6–9 cm long, 20–40-flowered, dense, gracile; peduncle 3–5 cm long, bright green. Sterile bract usually 1, 6–7 mm long, 1.1–1.4 mm wide, lanceolate, attenuate, acuminate at apex, 1-nerved, recurved. Floral bracts 2.5–6 mm long, 0.7–1.2 mm wide, lanceolate, acuminate at apex, 1-nerved, recurved. Ovary 1.6–2 mm long, green, sometimes with olive tint; pedicel 2.4–3 mm long; sinuate, green. Flowers about 6.5–8 mm long, 4–5 mm wide, yellow, golden-yellow to yellow-apricot. Dorsal sepal 3.9–4.2 mm long, 1.5–1.8 mm wide, ovate to oblong-ovate, subapiculate to obtuse at apex, middle nerve thicker

in apical half. Lateral sepals 3.5–3.8 mm long, 2–2.5 mm wide, oblique, ovate to broadly elliptic, obtuse to subacute at apex, slightly obcordate at base, middle nerve thicker. Petals 3.4–3.6 mm long, 0.5–1.5 mm wide, linear to linear-oblancoleate, obtuse at apex, commonly bent backwards. Lip 3.7–4.2 mm long, 3–3.5 mm wide, elliptic to obovate in outline, widest slightly above of its base; lamina 2–2.2 mm long, semi-orbicular at distal part, distinctly apiculate at top, lamellae 1.9–2.2 mm long, 0.25–0.4 mm high, 0.25–0.45 mm thick, simple, subparallel, lamina between lamellae flat and narrow, nearly stretching to lamina apex; auricles 1.7–2 mm long, 0.8–1.2 mm wide, obliquely triangular, obtuse to subacute at apices, subparallel. Gynostemium 1.5–1.6 mm long, 1–1.3 mm wide, bent backwards, entire surface minutely papillose, dark-green-blue; column paler coloured, above half of its length with small, erect, conelike appendage 0.1–0.2 mm long, 0.4–0.5 mm wide at base; staminodes 0.5–0.6 mm long, 0.4–0.5 mm wide at base, oblong, higher than anther, with distal margins simply, transversely truncate, folded back from anther, dark coloured; anther 0.4–0.5 mm long, 0.35–0.4 mm wide, pale coloured; rostellum greenish to dark-green. Fruit 0.8–1.2 mm long, 0.4–0.5 mm diam., oblong elliptic to oblong-obovate, middle green to greenish fawn.

This species is similar to *Pseudoliparis laevis* (Schlechter 1914). *Pseudoliparis umbonata* differs from it mainly by the elliptic leaves, linear to linear-ligulate petals, distinctly developed lip lamellae, recurved gynostemium with an abbreviated appendage, and staminodes transversely truncate at distal margins, distinctly folded back from the anther. According to Schlechter (1914), this species occurs at lower altitudes (ca. 300 m) than the other species of this group, but the recent collections (1979/1980) come from higher altitudes (up to 1400 m).

DISTRIBUTION: New Guinea. Alt. 300–1400 m.

HABITAT ECOLOGY: Terrestrial; on humus, on leaf litter, in shade, often near rivers, in forest, primary rain forest, amongst *Syzygium* and *Albizia*; flowering between October and December.

REPRESENTATIVE SPECIMENS EXAMINED. — Papua New Guinea. Central Province, Goilala District, above Tapini

Station, Mount Buguwato, *Reeve 3119* (K, LAE). Bismarck Archipelago, New Ireland, Namatanai subprovince, Hans Meyer Range, ca. 7 km WNW of Taron on E coast, slope above river valley on ascent from Mandih Lake, 152°59'N 4°26'S, *Sands, Pattison, J. J. Wood & Kene SANDS 20796* (K, K-spirit. coll.).

Pseudoliparis undulata (Schltr.) Szlach. & Marg. (Fig. 16)

Adansonia ser. 3, 21(2): 277. 1999. — *Microstylis undulata* Schltr., Repert. Spec. Nov. Reg. Veg., Beih. 1: 120. [1911] 1914. — *Malaxis undulata* (Schltr.) Hunt, Kew Bull. 24: 85. 1970. — *Crepidium undulatum* (Schltr.) Szlach., Fragm. Flor. Geobot., Suppl. 3: 133. 1995. — LECTOTYPE (here designated): Papua New Guinea, Kaiser-Wilhelms-Land, Kani Mountains Range (Madang Distr.), *Schlechter 16631* (L, holotype B+, isolecotype BO).

Plant 8–16 cm tall, slender, erect. Rhizome creeping. Leafy stem 4–11 cm long, terete, green, nearly completely covered by leaf petioles and sheaths. Leaves 8–15; leaf petiole 0.5–0.8 cm long, 0.2–0.6 cm wide when spread, erect, green; leaf sheath 0.4–0.7 cm long, 0.3–0.5 cm diam., paler green; leaf blade (1.6)2.5–4.5 cm long, (0.3)0.4–0.7 cm wide, oblique, linear to linear-oblancoleate, attenuate, apiculate at apex, slightly cuneate at base, margins undulate, 3-nerved, green above, paler grey-green beneath. Inflorescence 3.5–5 cm long, gracile; raceme 2–4 cm long, 4–20-flowered, lax, delicate; peduncle abbreviate, light green. Sterile bract usually 1, 3.5–4 mm long, 0.7–0.9 mm wide, lanceolate, attenuate, acuminate at apex, 1-nerved, erect. Floral bracts 2.5–4.8 mm long, 0.4–0.6 mm wide, lanceolate, acuminate at apex, 1-nerved, recurved. Ovary 1.5–1.8 mm long, 0.4–0.6 mm diam.; pedicel 2.2–2.5 mm long, 0.3–0.4 mm diam.; sinuate, green to pale green. Flowers about (5)6.8–8.6 mm long, (3)5.5–6.5 mm wide, yellow-green, lip yellow-olive. Sepals with middle nerves more distinct. Dorsal sepal (2.4)3–4 mm long, (1.4)1.6–1.8 mm wide, oblong-ovate, obtuse at apex. Lateral sepals (2.2)2.8–3.8 mm long, (1.6)1.8–2.2 mm wide, oblique, ovate to oblong-ovate, obtuse at apex, slightly obcordate at base. Petals (2.3)3.3–3.5 mm long, 0.7–0.8 mm wide, gently oblique, narrowly rhombic to spatulate, obtuse at apex, commonly bent backwards. Lip (3)4.8–6.5 mm long,

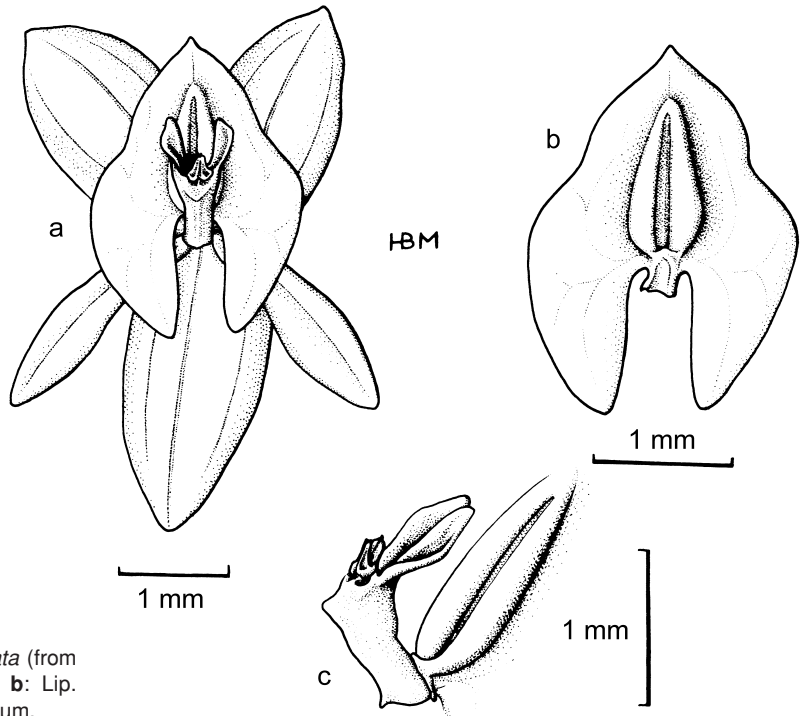


Fig. 16. *Pseudoliparis undulata* (from lectotype). — a: Flower. — b: Lip. — c: Lamellae and gynostemium.

(2.8)3.8–4.5 mm wide, hastate, widest about lamina base; lamina (2.2)3–3.5 mm long, transversally elliptic, distinctly apiculate at top (0.4–0.5 mm long, 0.5–0.6 mm wide at base), lamellae 2.3–2.5 mm long, 0.15–0.25 mm high, 0.25–0.4 mm thick, simple, subparallel, vanishing below lamina tip base, lamina between lamellae flat and slightly narrow; basal callus 0.4–0.5 mm long, 0.3–0.4 mm high, ca. 0.15 mm thick; auricles (1.8)2.5–3 mm long, 1.2–1.6 mm wide, oblique, oblong-obovate, obtuse at apices, spread. Gynostemium 1.6–2 mm long, 0.5–0.7 mm wide, erect, entire surface very minutely papillose; column recurved in apical half, pale-yellow-greenish, with small, erect, conelike appendage below of anther base ca. 0.2 mm long, 0.4–0.6 mm wide at base; staminodes 0.7–1 mm long, 0.5–0.65 mm wide, 0.15–0.25 mm thick, oblong cuneate, obliquely contracting up to apices, parallel, distinctly bent backwards, dark-green-blue; anther 0.4–0.6 mm long, 0.4–0.55 mm wide, oblong obcordate, pale, with green-blue tint; rostellum dark-green to blue-green.

This species is characterized by having 8–15 leaves, linear to linear-oblanceolate, and especially by the narrowly rhombic to spatulate

petals, hastate lip, lamellae vanishing distinctly below the lamina tip, gynostemium with small appendages below anther, staminodes bent backwards, elongate, and obliquely narrowed up to the apices.

DISTRIBUTION: New Guinea, known only from type collection. Alt. ca. 600 m.

HABITAT ECOLOGY: Terrestrial; on humus covered by leaf litter; in shady places, in forest; plants are occurring singly; flowering in October.

***Pseudoliparis kortylewskiana* Marg., sp. nova** (Fig. 17)

Sepalum dorsale fere rotundatum, majus quam labellum; labellum late sagittatum, lamellae tenues, strictae, leniter convexae, circa ad 2/3 longitudinem partis medianae columnae attingentes et per vittam aterrimam separatae; gynostemium solidum, basi valde dilatatum; stamen nisi aliquantum longior quam latus; staminodia stricta, ad dimidio longitudini staminis attingentia; rostellum ovale propter staminem protuberans, apice truncatum; appendix columnae

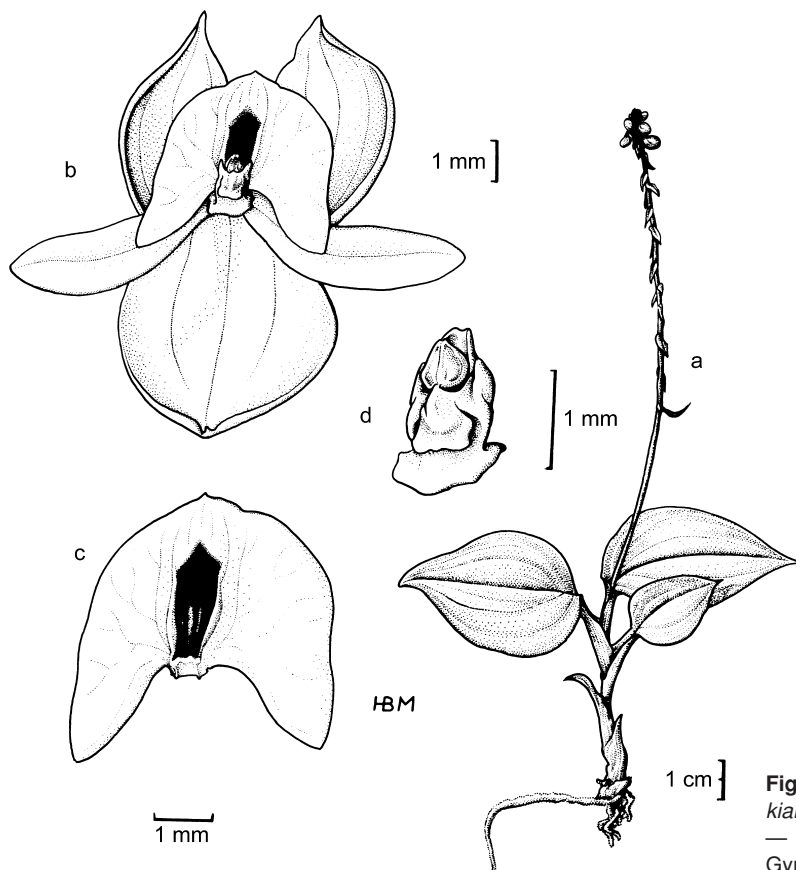


Fig. 17. *Pseudoliparis kortylews-kiana* (from holotype). — a: Plant. — b: Flower. — c: Lip. — d: Gynostemium.

gynostemii deorsum curvata, cum marginem patentissimam et glabram in parte apicali.

TYPE: Papua New Guinea, Simbu Prov., Gembogl Subprov., Ku'nigl, 03.II.1984, Sterly 1717 (holotype L).

Plant 8–18 cm tall, erect, single or in small clusters. Rhizome 2.8–4.5 mm diam., abbreviated. Leafy stem 2.4–3.8 cm long, 0.24–0.56 cm diam., few-nodded, erect, fusiform, nearly completely covered by leaf petioles, sheaths and loose, basal scales. Leaves 3–5; leaf petiole 0.5–1 cm long, 0.3–0.7 cm wide when spread; leaf sheath 0.7–1.1 cm long, 0.25–0.6 cm diam.; leaf blade 2.6–5.6 cm long, 1.8–3.5 cm wide, oblique, broadly ovate to ovate, distinctly attenuate, acuminate at apex, 3–5-nerved, medium green, paler beneath. Inflorescence ca. 14.2 cm long, elongate; raceme ca. 7.6 cm tall, 20–35-flowered, semidense; peduncle ca. 6.6 cm long. Sterile bracts few, 0.7–0.9 mm long, 1.5–1.8

mm wide, lanceolate, attenuate, acuminate at apex, 1–3-nerved, main nerve thicker and more distinct, reflexed. Floral bracts 3.5–6.8 mm long, 0.6–1.3 mm wide, lanceolate, attenuate, acuminate at apex, 1-nerved, reflexed. Ovary 1.6–2.2 mm long, 0.7–0.9 mm diam.; pedicel 2–3 mm long, 0.4–0.6 mm diam. Flowers 10–12 mm diam., yellow-green. Dorsal sepal 5–5.5 mm long, ca. 5 mm wide, orbicular to broadly ovate, distal margins broadly round, with apiculate apex, obcordate at base. Lateral sepals 4.5–4.6 mm long, 3–3.5 mm wide, oblique, broadly ovate, attenuate, apiculate at apex, obliquely obcordate at base. Petals 5.4–5.5 mm long, ca. 1.5 mm wide, falcate, oblanceolate, obtuse at apex, cuneate at base. Lip 4.8–5 mm long, 5–6 mm wide, hippocrepiform in general outline; lamina 2–2.2 mm long, mid-lobe abbreviate and broad, apiculate at apex, separated from lateral lobes by gently indentation, lamellae 1.5–1.7 mm long, 0.1–0.42 mm high and thick, simple,

parallel, dark coloured, vanishing about half of lamina, lamina between lamellae flat and broad, with dark chocolate-brown to nearly black, shining stripe, its top triangular; auricles 2.7–3 mm long, 1.7–1.8 mm wide at base, obliquely triangular, obtuse at apices, parallel to spread. Gynostemium 1.6–1.8 mm long, 0.8–0.9 mm wide 1.3–1.4 mm wide at base, with greenish tint in apical half; column erect, below anther base with large, flat and broad at distal margin, strongly bent-down appendage 0.4–0.5 mm long, 0.2–0.25 mm wide at base; staminodes 0.3–0.35 mm long, 0.2–0.3 mm wide, erect, distinctly abbreviate, shorter than anther, oblong-ovate, obtuse at apices; anther 0.4–0.5 mm long, ca. 0.4 mm wide, pale-yellow to white-yellow; rostellum with shallow indentation at distal margin, greenish.

ETYMOLOGY: Dedicated to Mrs. e. M. Kortylewska-Margońska, to whom I am grateful for valuable help during preparation of my taxonomic revisions of the genera.

This species is similar to *Pseudoliparis gregorii*, from which it differs mainly by the broadly ovate to ovate leaves, different shape of lip, distinct, erect lamellae (although vanish-

ing below the lamina tip), and the characteristic dark stripe between lamellae. The gynostemium is stout, with a distinct appendage and only shallow indentation at distal margin of rostellum.

DISTRIBUTION: New Guinea, known only from type collection. Alt. ca. 2540 m.

HABITAT ECOLOGY: Terrestrial; growing on humus covered by leaf litter, amongst minute mosses, in wet and shady forest.

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