Six New Species of *Bulbophyllum* (Orchidaceae) from Sulawesi

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Abstract


Introduction

The six new species described below once more underline the uniqueness of the Sulawesi orchid flora. The dual origins of its flora are demonstrated by the fact that, for instance, *Bulbophyllum reductum* belongs to an almost exclusively Papuan section of the genus, whereas *B. auriculatum* and *B. tubilabrum* have their phylogenetic roots in Asia, particularly the Sunda Shelf. *B. stenurum*, together with *B. hastiferum* Schltr., and *B. anakbaruppui* J.J. Verm. & P. O’Byrne, form a small, very distinctive series within sect. *Osyricera* entirely restricted to Sulawesi; they demonstrate the amount of speciation that has occurred on the island. *B. trichorhachis* is the second Sulawesi species of sect. *Hybochilus* with a racemose inflorescence. This character is otherwise almost absent in sect. *Hybochilus* as well as in assumedly related sections. Clearly, the Sulawesi flora deserves more attention than it gets at present.

*Bulbophyllum* sect. *Hybochilus*

*Bulbophyllum trichorhachis* J.J. Verm. & P. O’Byrne, *sp. nov.* – Fig. 1.
Bulbophyllum trichorhachis J.J. Verm. & P. O'Byrne, a Bulbophyllum iterans floribus multo minoribus (sepallum medianum 3.8 mm longum), labello carina medialis carenti differt. —TYPE: Indonesia, Sulawesi, central part. SBG-O4348 (SING.holo.).

Roots below the pseudobulbs. Rhizome creeping, 0.8–1 mm diam., sections between pseudobulbs 0.2–0.6 cm long, bracts not persistent. Pseudobulbs close together, ovoid, 0.4–0.65 x 0.2–0.4 cm. Petiole up to 0.02 cm long. Leaf blade elliptic to (ob)ovate, 1.3–1.9 x 0.35–0.5 cm, index (length/width) 2.6–5.4; acute. Inflorescence an elongated raceme, 3–4.8 cm long, 1–22-flowered. Peduncle erect to patent, 2.5–2.9 cm. Bracts not persistent.

Pseudobulbs close together, ovoid, 0.4–0.65 x 0.2–0.4 cm. Perioli up to 0.02 cm long. Lciferae elliptic to (ob)ovate, 1.7–1.9 x 0.35–0.5 cm, index (length/width) 2.6–5.4; acute.

Flowers not fully opening, each one developing only after anthesis of the previous. Pedicel and ovary 1.9–2.8 mm long, basal node on a c. 0.7 mm-long stump. Median sepal recurved, ovate, c. 4 x 1.5 mm, index 2.6–2.7; subacute, margins entire, base broadly attached; thin, 3-veined, glabrous. Lateral sepals 4 x 1.5 mm, index 2.6–2.7; lower margin somewhat ciliolate; otherwise as the median sepal. Petals porrect, ovate, c. 2.9 x 1.2 mm, index 2.4–2.5; subacute, margins ciliate, base narrowly attached; thin, 1-veined, glabrous. Lip slightly recurved near the base, general outline triangular, c. 2.9 x 0.7 mm, index c. 4.1 (all without artificial spreading); rounded, margins ciliate; rather thick; adaxially concave near the base, convex elsewhere, surface glabrous; abaxially without a ridge, surface with stiff hairs near the base, and with softer hairs elsewhere. Column c. 0.9 mm long, stigma without a tooth at its base, column foot absent. Stelidia porrect, triangular, c. 0.6 mm long, acute, with a slight, rounded wing along the upper margin. Anther abaxially with a distinct, papillose crest, surface otherwise finely papillose, front margin drawn out into an incurved, truncate beak with entire margins. Pollinia 4; ovoid, the inner c. 3/4 as long as the outer; no appendages present.

Colour: Flowers entirely dark purple.
Habitat: Epiphyte in montane forest, on branches of medium-sized trees. Alt. c. 1000 m.

Distribution: INDONESIA: Sulawesi, central part (1 specimen seen).

Notes: Similar to Bulbophyllum iterans J.J. Verm & P. O'Byrne, differs in having an unthickened, more elongated rhachis, smaller flowers (median sepal in B. iterans 10.5–11.2 mm long, in B. trichorhachis c. 4 mm long) and a lip without a median ridge.

Figure 1. Bulbophyllum trichorhachis J.J. Verm. & P. O'Byrne – a. Habit; b. Inflorescence; c. Flower analysis, from left to right: median sepal, petal, lateral sepal; d. Lip, left: adaxial side, right: abaxial side; e. Column and lip, lateral view; f. Anther, above: adaxial side, below: abaxial side; g. Pollinia, above: two pairs, below: a single pair. — All from SBG-O 4348 (spirit sample).
Bulbophyllum sect. Leptopus

Bulbophyllum valeryi J.J. Verm. & P. O’Byrne, sp. nov. – Fig. 2.

Bulbophyllum valeryi J.J. Verm. & P. O’Byrne, a Bulbophyllum melanictho pedunculo 2 mm longo, infra stigmatem umbonibus duobus distinctis differt. —

TYPE: Indonesia, Sulawesi, central part, SBG-O 4834 (SING. holo.).

Roots below the pseudobulbs. Rhizome creeping, 1-1.5 mm diam., sections between pseudobulbs 0.25-0.4 cm long, bracts not persistent. Pseudobulbs close together, ovoid, 0.45-0.7 x 0.3-0.55 cm. Petiole up to 0.1 cm long. Leaf blade elliptic to ovate, 1.2-2.8 x 0.4-0.5 cm, index (length/width) 3-5.6; obtuse to acute. Inflorescence 1-1.2 cm long, 1-flowered. Peduncle patent, 0.15-0.2 cm, bracts 2, the longest c. 1.8 mm long. Floral bract tubular, c. 2 mm, acute. Flowers not fully opening. Pedicel and ovary c. 4 mm long, basal node on a c. 1.2 mm-long stump. Median sepal recurved, triangular, c. 5.3 x 2 mm, index 2.6-2.7: acute, margins slightly and very finely papillose. base widely attached; thick, glabrous. Lateral sepals free, oblique, c. 5.8 x 2.2 mm, index 2.6-2.7: margins glabrous, otherwise as the median sepal. Petals porrect, ovate, c. 3.3 x 2 mm, index 1.6-1.7; acute, margins slightly erose and papillose, base narrowly attached; thin, glabrous. Lip hardly recurved, ovate, c. 2.8 x 1.2 mm, index 2.3-2.4 (all without artificial spreading), obtuse, margins papillose; thick; adaxially concave and with a median furrow in the basal half, slightly convex in the top half, surface glabrous but papillose towards the margins about half-way up the lip and with a patch of scattered glandular hairs in the top half; abaxially with a retuse median ridge near the base, surface finely papillose, coarser papillose along the margins towards the tip. Column c. 1.2 mm long, stigma with 2 distinct, papillose knobs at its base, column foot with retrorse triangular, obtuse wings near the tip. Stelidia triangular, c. 0.5 mm long, acute. Anther abaxially with a slight, rounded crest, surface finely papillose, front margin not drawn out. Pollinia 4; ellipsoid, the inner c. as long as the outer; no appendages present.

Colour: Sepals translucent pale greenish, suffused with ochrish red, veins ochrish red. Petals translucent, some dark purple specks near the base, tip entirely dark purple. Lip white, heavily suffused with purple.

Habitat: Epiphyte growing in small clusters on thin branches in montane forest. Alt. c. 1000 m.

Distribution: INDONESIA: Sulawesi, central part (1 specimen seen).

Figure 2. Bulbophyllum valeryi J.J. Verm. & P. O’Byrne – a. Habit; b. Flower; c. Flower analysis, from left to right: median sepal, petal, lateral sepal, lip; d. Lip: left: adaxial side, right: abaxial side; e. Column and lip, lateral view; f. Anther: left: adaxial side, right: abaxial side; g. Pollinia, left: two pairs, right: a single pair. – All from SBG-O 4834 (spirit sample).
Notes: This belongs to a suite of species within sect. *Leptopus* that is characterized by densely clustered pseudobulbs on a creeping or shortly ascendent rhizome, and a lip shape approaching what is commonly found in sect. *Fruticola* and in sect. *Epibulbin*. The species most similar to *Bulbophyllum valeryi* is *B. melinianthum* Schltr, from New Guinea. *B. valeryi* differs in having a very short peduncle and two distinct knobs below the stigma.

Named after Valeryus, son of Joseph Nasaret, who discovered this species.

*Bulbophyllum sect. Monilibulbus*

*Bulbophyllum auriculatum* J.J. Verm. & P. O'Byrne, *sp.* nov. — Fig. 3.

*Bulbophyllum auriculatum* J.J. Verm. & P. O’Byrne. a *Bulbophyllum minutulum* et *B. schefferi* ad labelli basin lobis lateralibus antrorsis triangularibus obtusis differt. — TYPE: Indonesia, Sulawesi, SBG-O 4360 SING, holo.)

Roots below the pseudobulbs. Rhizome creeping, 1.2–1.5 mm diam., sections between pseudobulbs 0.25–0.6 cm long, bracts not persistent. Pseudobulbs orbicular to narrowly ovoid, basal half prostrate on and fused to the rhizome, so that the new pseudobulbs arise c. half-way up the old, 0.35–0.9 x 0.28–0.35 cm. Petiole 1.8–3 mm long. Leaf blade ovate to elliptic, 0.65–1 x 0.22–0.32 cm, index (length/width) 2–3.5; acuminate. Inflorescence c. 5 cm long, 1-flowered. Peduncle erect to patent, c. 2.5 cm, bracts 2, the longest 3–3.5 mm long. Floral bracts tubular, c. 2 mm, acute. Flowers not fully opening. Pedicel and ovary c. 16.5 mm long, basal node on a c. 1.4 mm-long stump. Median sepal porrect with recurved top, ovate, c. 6.2 x 1.8 mm, index 3.4–3.5; acute, margins slightly erose-papillose towards the tip, base rather widely attached; thin, glabrous. Lateral sepals recurved, free, oblique, triangular, c. 7 x 2.3 mm, index 3–3.1; otherwise as the median sepal. Petals porrect, ovate, c. 2.3 x 0.8 mm, index c. 2.9; acute, margins slightly erose-papillose towards the tip, base widely attached; thin, glabrous. Lip recurved at c. 1/3 of its length, ± 3-lobed; midlobe ovate, c. 2.4 x 1.2 mm, index c. 2 (all without artificial spreading), rounded, margins very finely papillose; thick: adaxially concave and with 2 short ridges near the base converging distally and then fused to a small callus, beyond this callus a median furrow reaching up to about half-way the lip, adaxial surface papillose in the centre; abaxially with barely a median ridge, top part slightly concave, surface glabrous; lateral lobes erect, antrorse, attached along the proximal third of the lip, obliquely triangular, c. 0.5 mm high, obtuse, thin, glabrous. Column c. 1.4 mm long, rostellum thick, knob-shaped.

Figure 3. *Bulbophyllum auriculatum* J.J. Verm. & P. O’Byrne – a. Habit; b. Flower; c. Flower analysis, from left to right: median sepal, petal, lateral sepal, lip; d. Lip, left: adaxial side, right: abaxial side; e. Column and lip, lateral view; f. Anther, left: adaxial side, right: abaxial side. — All from SBG-O 4360 (spirit sample).
stigma without a tooth at its base. Column foot without teeth. *Stelidia* triangular, c. 0.4 mm long, acute, with a small, antrorse, obliquely deltoid, rounded to obtuse tooth along the upper margin. *Anther* abaxially with a widely rounded crest, surface ± glabrous, front margin somewhat drawn out into a triangular, obtuse beak. *Pollinia*: not seen.

*Colour*: Sepals yellowish orange. Lip red.

*Habitat*: Understorey epiphyte in montane forest, at c. 1800 m alt. Flowering observed in Sept.

*Distribution*: INDONESIA. Sulawesi, central part (1 specimen seen).

*Notes*: Most similar to *Bulbophyllum minutulum* Ridl., and *B. schefferi* (O. Kuntze) Schltr. *Bulbophyllum auriculatum* differs from both in having distinct lateral lobes at the base of the lip.

*Bulbophyllum tubilabrum* J.J. Verm. & P. O’Byrne, *sp. nov.* — Fig. 4.

*Bulbophyllum tubilabrum* J.J. Verm. & P. O’Byrne, a *Bulbophyllum hodgsonii* sepal mediano brevi lato (index 1.7–1.8 contra 4–5 in *B. hodgsonii*), floribus multo minoribus (sepa lateralia c. 4.8 mm longa contra c. 15 mm in *B. hodgsonii*) differt. — TYPE: Indonesia. Sulawesi, SBG-0 4935 (SING, holo.).

*Peduncle* erect to patent, c. 2.5 cm, bracts 2, the longest c. 2 mm long. *Floral bracts* tubular, c. 1.7–2 mm, acute. *Flowers* fully opening. *Pedicel and ovary* c. 10 mm long, basal node on a c. 1.2 mm-long stump. *Median sepal* porrect, ovate-triangular, c. 3 x 1.7 mm, index 1.7–1.8: acute-acuminate, margins entire. base widely attached: thin, glabrous. *Lateral sepals* recurved, free, oblique, elliptic-ovate, c. 4.8 x 2.8 mm, index c. 1.7; acute: otherwise as the median sepal. *Petals* porrect. ovate, c. 1.4 x 0.9 mm, index 1.5–1.6: subacute. margins entire, base rather narrowly attached; thin, glabrous. *Lip* somewhat recurved at c. 1/4 of its length, triangular near the base, cylindrical elsewhere with the margins folded back over the abaxial side and fused, c. 3.4 x 1.5 mm, index c. 2.2–2.3 (all without artificial spreading), rounded, margins entire; thick, glabrous; adaxially concave near the base, with a small cavity just above the ligament, ending in a knob that distally continues as a median strip of slightly thickened tissue ending about half-way up the lip as a drop-shaped callus, and with 2 short ridges bordering this median strip from 1/5 to 2/5 of the lip, abaxially with a rounded median ridge near the base. *Column* c. 1 mm long, stigma without a tooth at its base, column foot without teeth. *Stelidia* triangular, c. 0.4 mm long, acute, with a small, deltoid, rounded tooth along the lower margin. *Anther* abaxially with a widely rounded crest, surface papillose. front margin not drawn out. *Pollinia*: not seen.

*Figure 4. Bulbophyllum tubilabrum* J.J. Verm. & P. O’Byrne — a. Flower; b. Flower analysis, from left to right: median sepal, petal, lateral sepal, lip; c. Lip; above: adaxial side, below: abaxial side; e. Column and lip, lateral view; f. Anther, above: adaxial side, below: abaxial side. — All from SBG-O 4935 (spirit sample).
Bulbophyllum from Sulawesi
**Colour:** Sepals yellowish. Lip orange red.

**Habitat:** Understorey epiphyte in montane forest, at c. 1800 m alt. Flowering observed in Sept.

**Distribution:** INDONESIA. Sulawesi, central part (1 specimen seen).

**Note:** *Bulbophyllum hodgsonii* Hend. is most similar but has larger flowers with narrower sepals: median sepal 12–15 x 3 mm, index 4–5, lateral sepals c. 15 mm long.

**Bulbophyllum sect. Osyricera (= sect. Globiceps)**

**Bulbophyllum stenurum** J.J. Verm. & P. O’Byrne, *sp. nov.* — Fig. 5.

*Bulbophyllum stenurum* J.J. Verm. & P. O’Byrne, a *Bulbophyllum hastifero* rhachidi non incrassata differt. — TYPE: Indonesia, Sulawesi, central part, *SBG-O 4902* (SING, holo.).

Roots creeping along the rhizome towards its point of attachment, then spreading over the substrate. Rhizome ± pendulous with ± patent branches, up to 50 cm long. 4.5–5 mm diam., sections between pseudobulbs 3–5.6 cm long, bracts persistent. *Pseudobulbs* distant. ovate, 3.6–4.8 x 1–1.2 cm, distinctly and rather sharply 4–5-angled. *Petiole* c. 1 cm long. *Leaf blade* ovate, c. 19 x 2.2 cm, index (length/width) 8.6–8.7: acute. *Inflorescence* proct to recurved, a rather dense raceme, c. 6.5 cm long, c. 15-flowered. *Peduncle* c. 1.4 cm, bracts 2, the longest c. 8 mm long. Rhachis not thickened, c. 5 cm long. *Floral* bracts c. 3.5 mm, acute. Flowers not resupinate, spirally arranged, not fully opening, many open simultaneously. *Pedicel* and ovary 2.4–2.7 mm long, basal node ± flush with the surface of the rhachis. *Median sepal* ± porrect, ovate, c. 4.5 x 3.1 mm, index 1.4–1.5; top cucullate, rounded, margins entire, papillose-ciliolate, base rather narrowly attached; thin, 5-veined, surface adaxially glabrous, abaxially shortly hirsute. *Lateral sepals* adnate along the lower margins, basal part recurved, top part incurved, oblique, triangular, c. 5.6 x 2.4 mm, index 2.3–2.4, top flat, subacute, base broadly attached; 3-veined, otherwise as the median sepal. *Petals* recurved, ovate-triangular, c. 4 x 0.9 mm, index 4.4–4.5; acute, margins entire, ciliolate, base narrowly attached; very thin, 1-veined, surface adaxially finely papillose towards the tip, abaxially glabrous. *Lip* about straight, general outline ovate, c. 4 x 1.7 mm, index 2.3–2.4 (all without artificial spreading, hastate with a drawn out, elliptic midlobe and deltoid. acute sidelobes when spread); obtuse, margins entire; rather thick, glabrous; adaxially slightly concave near the base, with 2 parallel.

*Figure 5.* *Bulbophyllum stenurum* J.J. Verm. & P. O’Byrne — a. Habit; b. Flower; c. Flower analysis, from left to right: median sepal, petal, lateral sepal, lip; d. Lip, left: adaxial side, right: abaxial side; e. Column and lip, lateral view; f. Anther, left: adaxial side, right: abaxial side; g. Pollinia, left: two pairs, right: a single pair. — All from *SBG-O 4902* (spirit sample).
Bulbophyllum from Sulawesi
short, inconspicuous, rounded ridges at c. 1/3 of the length of the lip. Adaxial surface glabrous; abaxially ± without a ridge near the base, surface papillose in the distal 1/3 of the lip. Column c. 2 mm long. Stigma without a tooth at its base, column foot with 2 truncate wings near its base, and a conspicuous swelling just above the ligament. Stelidia minute, abruptly bent downwards but with an antorse, ± acute tip, along the upper margin with a very large (far more conspicuous than the stelidia themselves), antorse, wedge-shaped wing with a broadly rounded, erose top margin. Anther abaxially with a crest largely overtopping the front margin. Surface coarsely papillose. Front margin not drawn out.

Pollinia 4, the inner ± as long as the outer, all ellipsoid-ovoid: no appendages present.

Colour: Unknown.
Habit: Epiphyte in montane forest. Alt. c. 1000 m.
Distribution: INDONESIA: Sulawesi, central part (1 specimen seen).
Notes: Bulbophyllum hastiferum Schltr. is most similar but differs in having a thickened, spindle-shaped rhachis, it also has a narrower median sepal, a lip with a narrower midlobe, and an anther with a wider abaxial crest.

Bulbophyllum sect. Pelma

Bulbophyllum reductum J.J. Verm. & P. O’Byrne, sp. nov. – Fig. 6.
Bulbophyllum reductum J.J. Verm. & P. O’Byrne, a Bulbophyllum savaiensi ssp. subcubico columnae pede carenti, ad labelli basin sine cavitate distincta differt.

Roots growing along the rhizome towards its point of attachment, then spreading over the substrate. Rhizome erect to patent, up to 10 cm long. 1.8–2.4 mm diam., sections between pseudobulbs 0.8–1.2 cm long. Bracts persistent. Pseudobulbs distant, ovoid, 1.2–1.6 x 0.25–0.4 cm. Petiole 0.05–0.1 cm long. Leaf blade ovate, 2.3–3.4 x 0.75–0.85 cm, index (length/width) 3–4; acute. Inflorescences along the entire rhizome, porrect or recurved. Racemes, 0.5–1.05 cm long, 1–4-flowered. Peduncle 0.3–0.5 cm, bracts 4–5, the longest 2–3.5 mm long. Rhachis up to 0.55 cm. Floral bracts tubular proximally, 1.4–1.9 mm long, acuminate. Flowers not resupinate, little opening, several open simultaneously. Pedicel and ovary 1.3–1.7 mm long, basal node on a c. 0.6 mm-long stump. Median sepal porrect, ovate, c. 1.4 x 0.8 mm, index 1.7–1.8; rounded and apiculate, margins papillose towards the tip, base broadly attached; thick.

Figure 6. Bulbophyllum reductum J.J. Verm. & P. O’Byrne – a. Habit; b. Inflorescence; c. Flower analysis, from left to right: median sepal, petal, lateral sepal, lip; d. Lip, left: adaxial side, right: abaxial side; e. Column and lip, lateral view; f. Anther, above: adaxial side, below: abaxial side; g. Pollinia, above; two pairs, below: a single pair. – All from SBG-O 3886 (spirit sample).
1-veined, glabrous. *Lateral sepals* ovate-triangular, c. 1.7 x 0.8 mm, index 2.1–2.2; acuminate, margins entire; otherwise as the median sepal. *Petals* porrect, obovate, c. 0.9 x 0.55 mm, index 1.6–1.7: truncate-rounded, margins papillose towards the tip, base rather narrowly attached: thin, 1-veined, glabrous. *Lip* slightly recurved at c. 3/5 of its length, general outline elliptic, c. 0.8 x 0.7 mm, index 1.1–1.2 (all without artificial spreading): truncate-rounded, margins entire; rather thick, glabrous; adaxially slightly concave near the base, with a slight transverse callus about half way, top half concave with a transverse, triangular, subacute, thick tooth in the centre; abaxially without a ridge. *Column* c. 0.7 mm long, stigma without a tooth at its base, column foot absent. *Stelidia* about absent. *Anther* abaxially without a crest, surface papillose, front margin not drawn out. *Pollinia* 4: ovoid, the inner c. 2/3 as long as the outer; no appendages present.

**Colour:** Flowers cream-coloured.

**Habitat:** Epiphyte in mossy montane forest. Alt. 1100–1200 m.

**Distribution:** INDONESIA: Sulawesi, central part (1 specimen seen).

**Notes:** Deceptively similar in general habit to *Balbophyllum savaiense* Schltr. ssp. *subcubicum* (J.J. Sm.) J.J. Verm. Only when analyzing the minute flowers can *B. reductum* be distinguished at once by the absence of a column foot and of a distinct cavity at the base of the lip. The absent column foot makes inclusion of *B. reductum* in sect. *Pelina* problematic, but the marked overall similarity between *B. reductum* and *B. savaiense* leaves no other option.