NOTES RELATING TO THE FLORA OF BHUTAN: XLIV. TAXONOMIC NOTES, NEW TAXA AND ADDITIONS TO THE ORCHIDACEAE OF BHUTAN AND SIKKIM (INDIA)

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The terrestrial orchid genus Bhutanthera Renz (subfamily Orchidoideae, tribe Orchideae), comprising five species, three newly described here, is established. A new species, Herminium pygmaeum Renz, and three new varieties, Bulbophyllum cauliflorum Hook.f. var. sikkimense N. Pearce & P. J. Cribb, Cephalanthera erecta (Thunb.) Bl. var. ob lanceolata N. Pearce & P. J. Cribb, and Gymnadenia orchidis Lindl. var. pantlingii Renz, are here newly described. Five new combinations and one new name are proposed. Four new sections of Bulbophyllum are also established and their relationships discussed.

Keywords. Bhutan, new combinations, new taxa, orchids, Sikkim.

INTRODUCTION

During the preparation of the account of subfamily Orchidoideae for the orchid account for the Flora of Bhutan project, the late Jany Renz of Basel, Switzerland, identified a new genus, which he called Bhutanthera, four new species and a new variety. We validate his new taxa below.

A new name and a number of new taxa and combinations are also necessary prior to the publication of the account for the Flora. Discussions with J. J. Vermeulen (SING) and P. Ormerod (Cairns, Australia) suggested that four new sections of Bulbophyllum be established to accommodate Bhutanese species that fall outside the sections that are currently accepted.

Bhutanthera Renz, gen. nov.


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Etymology. From Bhutan, where most of the species are found.

The genus *Bhutanthera* comprises five terrestrial species confined to the alpine zone of the eastern Himalayas. It falls between *Habenaria* and *Platanthera* but is distinguished by having globose tubers, a 3-lobed lip and conjoined cushion-like stigmas.

The three new species of *Bhutanthera* described here, along with *Habenaria albomarginata* King & Pantling and *H. alpina* Hand.-Mazz., represent a difficult taxonomic group. *Habenaria albomarginata*, for example, has also been placed in *Platanthera* and *Peristylus*. Renz (personal communication) suggested that these five taxa might represent a sufficiently distinct taxonomic group to justify the establishment of a new genus for which he proposed the name *Bhutanthera*. He considered that it was related to *Platanthera* but differed in having a 3-lobed lip. This feature is not found in other *Platanthera* species from the region but is found in the genus elsewhere.

Some botanists (Inoue & Lin, 1980; Inoue, 1988) consider that the tuber shape is of particular taxonomic significance in the subtribe *Orchidinae*. On this basis alone it is difficult to justify the inclusion of this group in *Platanthera*. Luo (personal communication) considers that their distinctly globose tubers place them closer to the *Habenaria–Peristylus* complex. When King & Pantling described *H. albomarginata* they placed it in subgroup *Peristylus* (now considered a distinct genus). The globose tubers and 3-lobed lip of these five species place them nearer to *Habenaria* and *Peristylus* but they cannot be comfortably accommodated in either because of their conjoined cushion-like stigmas.

A more detailed investigation of the entire complex is undoubtedly needed before the complex can be satisfactorily resolved. Renz considered that the establishment of a new genus to accommodate this group was the most satisfactory solution given the present state of knowledge of the subtribe, and we concur.

**Key to the species of Bhutanthera**

1a. Lip obscurely 3-lobed; lateral lobes reduced, much shorter than the mid-lobe __________
   1b. Lip 3-lobed; lateral lobes equal to the mid-lobe _______________________________ 2

2a. Inflorescence 1–2-flowered _______________________________ 3
2b. Inflorescence more than 3-flowered _______________________________ 4

3a. Sepals white; petals and lip red _________________________________ *B. albosanguinea*
3b. Sepals yellowish-green; petals yellowish-green to white; lip white __*B. albovirens*

4a. Sepals green with white margins; flowers less than 5mm across; inflorescence more than 5-flowered _________________________________ *B. albomarginata*
4b. Sepals white; flowers more than 5mm across; inflorescence less than 5-flowered _________________________________ *B. himalayana*
**Bhutanthera albomarginata** (King & Pantling) Renz, **comb. nov.**


**Distribution and ecology.** India (Sikkim). On alpine meadows and yak-grazed slopes, 3720–4270m. Flowering between July and September.

*Additional specimens examined.* INDIA. Sikkim, Nathang, 13 vii 1877, *King* 4367 (K); Sikkim, Tsomgo Chho, 8 vii 1996, *Long & Noltie* 71 (E); Sikkim, Yampung, 12 viii 1913, *Rohmoo* 1098 (E).

*Bhutanthera albomarginata*, selected as the type for the genus, is well illustrated on plate 425 by King & Pantling (1898). They originally described it as *Habenaria albomarginata*, commenting that ‘the centrifugal inflorescence is a very unusual feature in Habenaria’. It was transferred by Kränzlin (1898) to *Platanthera* with the comment ‘Erinnert habituell an ein etwas gestauchtes massiv gebautes Exemplar von *Platanthera viridis* Lindl.’ (*Platanthera viridis* is now treated as *Coeloglossum viride* (L.) Hartman). Finally, Banerji & Pradhan (1984) transferred it to *Peristylus* but without any explanation.

**Bhutanthera albosanguinea** Renz, **sp. nov.**

*Bhutantherae albomarginatae* affinis sed planta minore, usque 5cm alta, inflorescentia biflora, sepalis albis, petalis et labello rubris bene distinguenda.

Type: Bhutan, Thimphu district, Darkey Pang Tso, 4 viii 1991, *J.R.I. Wood* 7405 (holo. E!).

*Plant* terrestrial, small, 4.5cm tall; tuber not seen. *Stem* erect, glabrous, sheathed at base, 3cm tall; stem sheath tubular, apex unknown (specimen damaged), 1.1cm long. *Leaves* 2, towards apex of stem, lanceolate, acute, tapering gradually to a sheathing base, margins entire to subundulate, strongly nerved, 2.3–2.5 × 0.4–0.8cm. *Inflorescence* terminal, racemose, 2-flowered; rachis 1cm long; floral bract very reduced. *Flowers* large for plant, 1–1.3cm across; sepals white, petals red, lip red; pedicel and ovary twisted, 7–9mm long. *Dorsal sepal* elliptic-obovate, rounded, margins glandular, 1-nerved, 5 × 4mm; *lateral sepals* elliptic, subacute, margins glandular, 1-nerved, 6 × 4mm. *Petals* spatulate, rounded, cucullate at apex, margins entire, 5 × 2.2mm (at wide apex). *Lip* 3-lobed, narrowed and subunguiculate at base, spurred, base 1 × 1mm; lateral lobes ligulate, obtuse, 3 × 1mm; mid-lobe ligulate, obtuse, 3 × 1mm; spur conical, 2mm long. *Column* short, 1.5–2 × 1.5mm; pollinia 1.6mm long. *Fruit* not seen.
Distribution and ecology. Bhutan. In rock crevices, on cliffs, 4100m. Flowering in August.

*Bhutanthera albosanguinea* is related to *B. albomarginata* but differs in having a 2-flowered inflorescence, white sepals, red petals and a red lip. The type sheet consists of a single, slightly damaged plant.

*Bhutanthera albovirens* Renz, sp. nov. Fig. 2.

*Bhutanthera albosanguinea* is related to *B. albomarginata* but differs in having a 1–2-flowered inflorescence, yellowing-green sepals, yellowish-green to white petals and a white lip.

*Bhutanthera alpina* (Hand.-Mazz.) Renz, comb. nov.

Basionym: *Habenaria alpina* Hand.-Mazz. in Symb. Sin. Pl. 7: 1336 (1936). Type:
distribution and ecology. India (Sikkim), Bhutan and China (Yunnan). In damp alpine meadows and yak-grazed slopes, 4270–4300m. Flowering in July.

additional specimens examined. BHUTAN. Upper Kuru Chi district, Narim Thang, 25 vii 1949, Ludlow, Sherriff & Hicks 21345 (BM).

This species was first described as Habenaria alpina by the Austrian botanist Heinrich Handel-Mazzetti in 1936. It has the globose pseudobulbs, a trilobed spurred lip and conjoined stigmas characteristic of the genus. Its distinction from other species is given in the key above.

Bhutanthera himalayana Renz, sp. nov. Fig. 3.
Bhutantherae albovirens affinis sed planta minore usque 6.5cm alta, inflorescentia minus quam 5-flores ferenti et floribus niveis satis differt.
Type: Bhutan, Upper Bumthang Chu district, Pangotang-Tsampa (Chamka), 1 vii 1949, Ludlow, Sherriff & Hicks 19304 (holo. E!, iso. BM!).

Plants terrestrial, small, 5–6.5cm tall; tuber ovoid to globose, 0.7–0.9 × 0.4–1cm. Stems erect, lower half sheathed by leaf-sheaths and basal sheath, 2-leaved, 2.5–4cm long; sheath tubular basally, splitting to form a broadly lanceolate, acute to subacute apex, 1.3–1.9cm long. Leaves 2, subopposite, sheathed, lanceolate-elliptic, obtuse to subacute, 1.5–2cm long. Inflorescence terminal, simple-racemose, subsecund, laxly 3–4-flowered; rachis glabrous, 1–2cm long; floral bracts minute, triangular-lanceolate, acute, 0.5–0.6 × 0.6–0.8mm. Flowers medium-sized for plant, 0.7–0.9cm across; uniformly white, dorsal sepal with a green central nerve; pedicel and ovary glabrous, twisted, 5–6mm long. Dorsal sepal ovate-elliptic, subacute, 1-nerved, 5 × 3mm; lateral sepals ovate-lanceolate, obtuse to subacute, 1-nerved, 6 × 2.8mm. Petals short, spathulate, obtuse, cucullate at apex, 2.5 × 1.5mm. Lip 3-lobed, shortly unguiculate at base, spurred, base 1mm long; lateral lobes linear, widening slightly at base, acute, 2.5 × 0.6mm; mid-lobe linear to ligulate, obtuse, 4 × 0.8mm; spur cylindrical-conical, obtuse, 1.5–2mm long. Column short, 1–1.5mm long; rostellar processes 0.25mm long; pollinaria 1.2mm long. Fruit not seen.

Fig. 2. Bhutanthera albovirens: A, habit; B, leaf (detail); C, inflorescence; D, flower (front view); E, flower and ovary (side view); F, dorsal sepal; G, lateral sepals; H, petals; I, lip; J, column (with upper part of lip); K, column (front view); L, column (back view); M, pollinaria with pollin grains. Drawn by Susanna Stuart-Smith from Ludlow & Sherriff 3441 (BM). Double bar-line = 1cm; single bar-line = 1mm.
Distribution and ecology. Bhutan. Among dwarf rhododendrons on steep hillsides, on open grassy hills and cliff-ledges, 3960–4570m. Flowering from July to August.

Additional specimens examined. BHUTAN. Thimphu district: Barshong [Parshong], 27 vii 1914, Cooper 1979 (E); Pumo La, viii 1938, Gould 1294 (K); Upper Pho Chu district: Kesha La [Chesha La], 27 vi 1949, Ludlow, Sherriff & Hicks 16640 (BM); Upper Bumthang Chu district: Marlung, 12 vii 1949, Ludlow, Sherriff & Hicks 19413 (BM, E); Upper Kulong Chu district: Shingbe, 24 vi 1949, Ludlow, Sherriff & Hicks 20401 (BM).

*Bhutanthera himalayana* is closely related to *B. albomarginata* but differs in having flowers of more than 5mm across and white sepals, and less than five in an inflorescence.

The following new taxa and new combinations are also proposed here:

**Herminium pygmaeum** Renz, sp. nov. Fig. 4.

_Herminium nivale_ Schtr. affinis sed foliis anguste lineari-oblongis, inflorescentia 3–5-flora, petalis trullatis non erectis, labello trilobato ad basin petalis adnato distinguenda.

Type: Bhutan, Thimphu district, below Darkey Pang Tso, 4 viii 1991, Noltie 105 (holo. E!).

*Plant* terrestrial, minute, 2–5cm tall; *tuber* globose, 3–4 × 2–3mm. *Stem* erect, slender, base sheathed and a single sheath up bract up stem, 1.5–3.5cm long; basal sheath large for plant, mouth wide, apex ovate, subacute, 1–1.5cm long; stem bract lanceolate, acute, 2.5 × 0.5mm. *Leaves* 3, narrowly linear-oblong, subacute, emerging from within the sheath, 1.5–3.5 × 0.05–0.15cm. *Inflorescence* terminal, simple, racemose, secund, subdensely 3–5-flowered; rachis glabrous, 5–7mm long; floral bracts minute, lanceolate, acute, 0.5–1 × 0.5–0.6mm. *Flowers* small, 3mm long; sepals green, petals yellowish; pedicel and ovary tumid, narrowing towards apex, 3 × 1–1.3mm. *Dorsal sepal* ovate, subacute to obtuse, slightly verrucose on exterior surface, 3 × 2mm; *lateral sepals* lanceolate-ovate, subacute, 1-nerved, 4 × 1.5mm. *Petals* trullate, constricted towards apex, apex fleshy, subacute, 1-nerved, 3.5 × 1.5mm. *Lip* 3-lobed, base long and gradually widening, spurless, 4 × 1.5mm; lateral lobes triangular, obtuse; mid-lobe narrowly triangular, acute, 1mm long. *Column* short, 0.5mm tall. *Fruit* not seen.

Distribution and ecology. Bhutan, Thimphu district, below Darkey Pang Tso. Very wet cliff-ledge with *Juncus trichophyllus* and *Parnassia* sp., 3960m.

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**FIG. 3.** *Bhutanthera himalayana:* A, habit; B, flower (side view); C, dorsal sepal; D, lateral sepal; E, petal; F, lip; G, lip, column and ovary; H, lip and column; I, column; J, pollinaria. Drawn by Susanna Stuart-Smith from Ludlow, Sherriff & Hicks 19304 (E). Double bar-line = 1cm; single bar-line = 1mm.
**Herminium pygmaeum** is allied to the Chinese *H. nivale* Schltr. and to the Sikkimese *H. angustilabre* King & Pantling. It is a minute plant with three narrowly linear-oblong leaves and three to five flowers that have a spurless lip that is adnate to the column base, and two pollinia with very short caudicles and large viscidia. The type was examined by Renz (personal communication), who proposed the name.

**Bulbophyllum cauliflorum** Hook.f., Fl. Brit. India 5 (2): 758 (1890); Icon. Pl. 21: t.2036 (1892). Lectotype (selected here): India, Khasia Hills, *Griffith* Kew. Dist. 5139 (K!). **Fig. 5.**

var. **sikkimense** N. Pearce & P. J. Cribb, var. nov.
In habitu varietati typicae similis sed petalis uninnervius differt.
Type: India, Sikkim, Choongthang, *J.D. Hooker* 36B (holo. K-LINDL!, iso. K!).

*Plant* epiphytic; rhizome terete, woody, branched, 1.5–3mm thick; roots nodal, filiform, clustered. *Pseudobulbs* cylindrical to elliptic, slightly dilated towards base, obliquely attached to rhizome, spaced, 3.1–4.1 × 0.3–0.8cm; spaced at intervals of 6.1–12.1cm along the rhizome. *Leaf* single, oblong-elliptic, obtuse, narrowing and petiolate at base, 5.7–9.2 × 1.5–2.9cm; petiole channelled, 0.9–1.4cm long.

*Inflorescence* basal from pseudobulb and along rhizome, subumbellately 4–5-flowered; peduncle slender, glabrous, sheathed at base, 1.2–2.1cm long; peduncle bract tubular, lanceolate, 5–7.7mm long; rachis slender, 2–4mm long; non-floral bract lanceolate, acuminate, 4–4.5 × 1.5–2mm; floral bracts linear-lanceolate, acute to acuminate, entire, 2.5–3 × 0.3–0.5mm. *Flowers* not fragrant, 6–8mm across; sepals and petals green flushed with brown (tips of sepals yellow), lip green-brown; pedicel and ovary slender, 3.5–4.5mm long. *Dorsal sepal* linear-lanceolate, caudate-acuminate, margins entire, 3-nerved, spreading, 4–8 × 0.3–0.4mm (at base); *lateral sepals* similar, subfalcate. *Petals* narrowly lanceolate, acuminate, 1-nerved, 2.5–5 × 0.3–0.4mm (at base). *Lip* simple, lanceolate, base truncate, deflexed below the centre, subacute, excavated-challeled from base to near the apex, margins entire, attached to column-foot, 1–1.5 × 0.3–0.5mm. *Column* short, broad, apex with 2 acuminate stelidia, 0.5mm tall; column-foot short, arcuate, 1–2mm long; stigma large. *Fruit* not seen.

**Distribution and ecology.** India (Darjeeling and Sikkim). In tropical valleys, 660–2000m. Flowering June to August.

*Additional specimens examined.* INDIA. Sikkim, Lukrap [Sitong], vii 1893, *Pantling* 221A (BM, K, W); Lukrap [Sitong], vii 1895, *Pantling* 221B (K); Chunchang [Choongthang], vii 1897, *Pantling* 221C (BM, K, W); Sikkim, unlocalized, viii 1892, *Pantling* 230A (BM, E, K);

**FIG. 4.** *Herminium pygmaeum*: A, habit; B, flower and ovary; C, dorsal sepal; D, lateral sepal and petal; E, lip and column; F, lip, petals and lateral sepals with column; G, column (front view); H, column (side view); I, pollinaria. Drawn by Susanna Stuart-Smith from *Noltie* 105 (E). Double bar-line = 1cm; single bar-line = 1mm.
Examination of the type material of *B. cauliflorum* shows that there is variability in the number of veins on the petals. *Griffith* 5139 has distinctly lanceolate petals with three veins while *Griffith* 5165 and *Hooker* 36B both have petals with a single vein. All of the material from Sikkim has flowers with petals that have a single vein. We believe that this represents a local variation and propose varietal status for these plants. We propose to lectotypify *B. cauliflorum* with *Griffith* 5139, while *Griffith* 5165 and *Hooker* 36B are both referable to *B. cauliflorum* var. *sikkimense*.

King & Pantling (1898) identified *Pantling* 230, from Sikkim, as *B. protractum* Hook.f. but noted that his plants had petals with a single vein. We have examined this material and believe that it is referable to *B. cauliflorum* var. *sikkimense* and that *B. protractum* does not occur in our area.

*Bulbophyllum cauliflorum* is closely related to *B. collettii* King & Pantling from Assam. King & Pantling (1897) stated that the latter grows in dense masses, is a smaller plant with different sepals and petals and that there is a difference of two months in the flowering time. Pantling collected a plant from Shillong that was flowering in June. The type material of *B. collettii* (Assam, *G. Rita & H. Collett*) is at CAL and we have been unable to examine it. Further collections will have to be examined before its status can be clarified.

The floral structure of *B. cauliflorum* var. *sikkimense* resembles that of *B. laxiflorum* (Bl.) Lindl. but that species has clustered, rather than well-spaced, pseudobulbs.

**Cephalanthera erecta** (Thunb.) Bl., Coll. Orch.: 188, t.65, f.2 (1858). *Fig. 6.* Basionym: *Serapias erecta* Thunb., Fl. Jap.: 27 (1784). Type: Japan, Kutjinawa, Thunberg 21322 (holo. UPS!).

var. *oblanceolata* N. Pearce & P. J. Cribb, var. nov.

Varietati typicae similis sed labello petaloideo et calcare deficienti differt.

Type: Bhutan, Punakha district, between Mishichen and Khosa, 10 v 1967, Kanai, Murata, Ohashi, Tanaka & Yamazaki 13575 (holo. TI!).

*Plant* terrestrial, 18–30cm tall. *Stem* foliaceous, 1–3mm thick, leaves sheathing basally. *Leaves* distichous, ovate to ovate-lanceolate, acute to subacute, sessile, prominently 3–5-nerved, 5–7 × 1.5–2cm. *Inflorescence* terminal, racemose, 6–8-flowered; rachis 4–7cm long; floral bracts lanceolate, acute, 2–3 × 0.5–1mm, lowest floral bract
foliaceous, lanceolate, acute, c.2×0.3cm. Flowers small, 0.7–0.9cm long; white; pedi-
cel and ovary 5–8mm long. Dorsal sepal oblanceolate, subacute, 3-nerved, 1×0.2cm;
lateral sepals lanceolate, subacute, 3-nerved, 9×2mm. Petals obovate, obtuse,
3-nerved, 9×1.5mm. Lip simple, peloric, obovate, obtuse, 3-nerved, 9×2mm. Column
straight, erect, narrowly winged at apex, c.3.4mm long; stigma broad, fleshy;
pollinia 1.5×1mm. Fruit not seen.

Distribution and ecology. Bhutan, Punakha and Upper Mo Chu districts (between
Rimchu [Rinchu] and Khosa). 1400–1600m. Flowering May.

Material of this variety is identical in habit to that of the typical variety but the lip
is simple, unadorned and lacks a spur. We believe that it is a peloric variant of C.
erecta. We have examined several collections and they uniformly have such flowers.
The typical variety has yet to be collected in Bhutan.

Wallich 7039B (lecto. K-LINDL!, iso. K-W! K!, selected here). Fig. 7.

var. pantlingii Renz, var. nov.

Variatati typicae similis sed floribus minoribus, sepalo dorsali lanceolato, sepalis
lateralibus ovato-ellipticis, petalis late ovatis acutis, labello simplici vel obscure trilo-
bato acuto, lobis lateralibus quum praesentibus anguste rotundatis, lobo medio
oblongo ad apicem papillosos, calcar ad apicem angulato distinguenda.

Type: India, Sikkim, Tankra-la, vii 1987, Pantling 404B (holo. BM!, iso. K!).

Plant habit, stem, leaves and inflorescence similar to G. orchidis var. orchidis. Flowers
small, 3–4mm across. Dorsal sepal lanceolate, narrowing to acute apex, 3-nerved,
3.5–4×1.5–2mm; lateral sepals ovate-elliptic, subacute, spreading, 3×2mm. Petals
broadly ovate, acute, 2.5×2mm. Lip simple to obscurely 3-lobed, 3×1mm; lateral
lobes (when present) narrowly rounded; mid-lobe narrowly oblong, tapering to
rounded, papillate apex, 1mm long; spur shorter than in typical variety, angled,
curved forward, 5.5–6cm long, angled 2mm from the apex.

Distribution and ecology. Bhutan and India (Sikkim). In damp meadows and open
hillsides, 3580–4270m. Flowering July to September.

Additional specimens examined. BHUTAN. Thimphu district, Chelai La [Cile La], 3 vii 1971,
Bedi (K, THIM); Pajoding, 19 vii 1979, Grierson & Long 2775 (E).

INDIA. Sikkim: Dzongri, 2 vii 1983, Starling, Upward, Brickell & Mathew 287 (K);
Lachung [Lachong], 18 vii 1937, Lowndes 606 (E); Yampung, 21 vii 1913, Rohmoo 842 (E).
This variety can be distinguished from the typical one in having smaller flowers, a lip that is simple to obscurely 3-lobed with a papillose apex and a spur that is angled from the apex.


var. _josephi_ (Rchb.f.) N. Pearce & P. J. Cribb, _comb. nov._


_Distribution and ecology._ NE India and Bhutan. On open, grassy subalpine hillsides, in _Betula utilis_ D. Don forest, among dwarf _Rhododendron_ spp., and on grassy stream banks, 3660–4880m. Flowering July–September.

_Additional specimens examined._ BHUTAN. Thimphu district: Sharna, 12 vii 1938, _Gould 1083_ (K); Upper Mo Chu district: Chomo Lhari, 12 ix 1912, _Rohmoo 450_ (E); Laya, 30 vii 1983, _Sargent 376_ (E); Lingshi, 20 vii 1914, _Cooper 1608_ (BM); Tharizam Chu, 24 ix 1884, _Sinclair & Long 5289_ (E, THIM); Upper Pho Chu district: Gyophu La [Gaffoo La], 4 vii 1949, _Ludlow, Sherriff & Hicks 16725_ (BM); Upper Bumthang Chu district: Marlung, 11 vii 1949, _Ludlow, Sherriff & Hicks 19397_ (BM); Upper Kulong Chu district: Me La, 1 vii 1949, _Ludlow, Sherriff & Hicks 20444_ (BM).


CHINA. Xizang [Tibet], Chumbi Valley, Lingmathang, 27 vii 1884, _King’s collector 22_ (K); Chumbi Valley, Phari, vii 1879, _Dungboo s.n._ (K); Khambu, 10 vii 1939, _Gould 2360_ (K); SW of Lhozak Valley, 22 vii 1994, _Dickore 9740_ (GOET).

Renz (personal communication) considered _H. josephi_ to be conspecific with _H. diphylla_. However, it differs from _H. diphylla_ in that the stem is ebracteate while in _H. diphylla_ there are many bracts above the leaves. It differs from _H. aitchisonii_, where it was placed as a variety by Joseph Hooker (1890), in having coiled tips to the lateral lobes of the lip.

Kränzlin (1893) described _H. clarkei_, based upon a collection (Herb. Ind. Or. No. 42), from Sikkim by Hooker. J. Hooker’s collection number ‘42’ from Sikkim.

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_FIG. 7._ Gymnadenia orchidis var. pantlingii: A, habit; B, flower with floral bract; C, dorsal sepal; D, lateral sepal; E, petal; F, lip (without spur); G, lip; H, lip; J, lip with column (detail); K, lip, spur and ovary (side view); L, column (side view); M, column (front view); N, pollinaria; Gymnadenia orchidis var. orchidis: O, lip; P, lip with spur. Drawn by Susanna Stuart-Smith, A and H from Pantling 404B (K); B–H, J–N from Bedi 394; O–P from Wallich 7039A (K). Double bar-line = 1cm; single bar-line = 1mm.
actually refers to part of the type collection of both *H. josephi* and *H. josephi* var. *aitchisonii*. The type material referred to by Kraenzlin has probably been destroyed. The description closely resembles *H. diphylla* but the petals are described as ‘bipartitis’ which is not the case with *H. diphylla*. We are sure that the specimen referred to by Kraenzlin is part of the type material referred to above and are therefore confident that it can be reduced to synonymy here.

**Thunia alba** (Lindl.) Rchb.f. in Bot. Zeitung (Berlin) 10: 764 (1852).


var. *bracteata* (Roxb.) N. Pearce & P. J. Cribb, **comb. et stat. nov.**


**Distribution and ecology.** Nepal and NE India. Epiphytic, 660–1600m.

*Additional specimen examined.** INDIA. Sikkim, 1891, Pantling 171 (K).

There has been considerable debate as to the identity of this taxon since Rolfe (1905) distinguished *T. venosa* from plants previously grouped under *T. alba* (Lindl.) Rchb.f. Seidenfaden (1986) reviewed the position but it is worth pointing out that the Wallich plate of *Phaius albus* (t.198, 1831) has a lip with a yellow centre and pink branching veins. The only consistent difference between *T. bracteata* and *T. alba* seems to be the absence of yellow on the lip in the flowers of the former. The keels have been described as obscure but a photograph at Kew of *T. bracteata* clearly shows long, fimbriate keels on the lip.

It has been impossible to identify any authentic specimens of var. *bracteata* from Bhutan and Sikkim but Pradhan (1979) reported it from Sikkim and Darjeeling as *T. venosa* Rolfe. The original collection from the Garrow [Garo] Hills has probably been lost and Seidenfaden (1986) proposed the above neotypification.

Because the differences in vegetative and floral morphology between *T. alba* and *T. bracteata* are so slight we here propose that the plants lacking the yellow patch on the lip be treated as a variety of *T. alba*. Clearly further collections are required to test this solution.

**Goodyera clavata** N. Pearce & P. J. Cribb, **nom. nov.**

Distribution and ecology. India (Sikkim). 1200m. Flowering August.

King & Pantling (1898) described this species giving it the name *G. grandis*. However, they had apparently overlooked the earlier publication of the epithet by Blume for *Neottia grandis* when describing a plant from Bantam in Java in 1825. Later, in 1858, Blume transferred it to *Goodyera* as *G. grandis* in his *Flora Javae et Insularum adjacentium*. King & Pantling mentioned that the plant they described differed from all other *Goodyera* species by its characteristic clavate callosity on the anterior surface of the column below the stigma. We have examined the type specimen (*Pantling 460*) and material of *G. grandis* Bl. from Java and are confident that they are different species. The Himalayan plant has a lip lacking a claw, its apex is small, reflexed and adpressed to the sac which has setose swellings laterally, and the column has the characteristic clavate swelling. The Javanese plants have a lip with a central claw, a much longer recurved apex that is not adpressed to the sac, that has setose swellings mainly at the junction between the sac and the mesochile and a column lacking a clavate swelling.

**Platanthera cumminsiana** (King & Pantling) Renz, **comb. nov.**


King & Pantling (1896) commented that their new species, *Habenaria cumminsiana*, was related to *H. pachycaulon* Hook.f. and belonged within section *Hologlossa* Hook.f. This section is characterized by plants with entire petals and a simple, entire, linear lip. Many of the species within this section have already been transferred to *Platanthera*, including *H. pachycaulon* Hook.f. (as *P. pachycaulon* (Hook.f.) Soó). The elongate rhizomatous tuber and the simple lip of *H. cumminsiana*, both characteristic of *Platanthera* species from the Himalayas, confirm that it belongs in *Platanthera*.

**Peristylus alaschanicus** (Maxim.) N. Pearce & P. J. Cribb, **comb. nov.**


Seidenfaden (1977) considered this species to be conspecific with *Herminium lanceum* (Thunb. ex Sw.) Vuijk. However, we have examined several specimens from China that agree well with *H. alaschanicum* but are quite distinct from *H. lanceum*. It is also clear that *H. alaschanicum* does not belong in *Herminium*. Maximowicz (1887) mentions its ‘calcari scrotoformi’ in the protologue and examination of the type specimen confirms this. The genus *Herminium* does not have a distinct spur. This species is here transferred to *Peristylus*. The Chinese *Habenaria spiranthiformis* agrees well with *P. alaschanicus*, also having a short scrotoform spur, and we here reduce it to synonymy.
Cleisocentron pallens (Cathcart ex Lindl.) N. Pearce & P. J. Cribb, comb. nov. Fig. 8.
C. trichromum (Rchb.f.) Brühl, Guide Orchids Sikkim: 137 (1926).

Distribution and ecology. India (Sikkim). 330–630m. Flowering in July and August.

The taxonomy of this species has been the source of confusion for some time. Brühl (1926) based the description of his monotypic genus, Cleisocentron, on that of King & Pantling (1898). He selected Saccolabium trichromum as the type and reduced S. pallens to synonymy. Garay (in Seidenfaden, 1992) considered that these might be two distinct species based upon the difference in the appearance of the column-foot. Seidenfaden (1992) mentioned that the plate in Xenia Orchidacea (2: 119, t.139 (1874)) of S. trichromum shows no clear column-foot while the plate in King & Pantling (1898) showed a distinct column-foot. The illustration of Cathcart associated with the description of S. pallens clearly shows a column-foot and in all the Sikkim material we have seen has this feature. We believe that the plate in Xenia Orchidacea probably does indicate a decurrent column-foot by the constriction of the column into two equal parts. We have carefully examined these taxa and believe them to be conspecific. Garay (personal communication) agrees with this position.

There is an additional problem concerning the correct name for this species. The publication of S. pallens by Lindley was issued on 20 August 1858, while the reference by Reichenbach relating to S. trichromum, was published in February 1859. Therefore, the name S. pallens takes precedence over S. trichromum and the new combination based on the former is made above.

Bulbophyllum Thou.

We have chosen to accept Bulbophyllum as a broadly defined genus in the Flora of Bhutan treatment, whilst realizing that current work on the phylogeny of tribe Bulbophyllinae may lead to its narrower circumscription as advocated, for example, by Garay et al. (1994). Four new sections of Bulbophyllum are needed to accommodate Himalayan species of the genus that occur in the Flora of Bhutan region. These are as follows:

FIG. 8. Cleisocentron pallens: A, habit; B, flower with part of inflorescence (two views); C, dorsal sepal; D, lateral sepal; E, petal; F lip (front view); G, lip (side view); H, lip (sectioned); I, lip, column and lateral sepal; J, column; K, column (with anther removed); L, anther (three views); M, pollinarium. Drawn by Susanna Stuart-Smith from Pantling 92 (K). Double bar-line = 1cm; single bar-line = 1mm.
**Bulbophyllum** section *Biseta* J. J. Vermeulen, **sect. nov.**

Affinis *Bulbophyllum* section *Racemosis* sed folio unico, inflorescentia basali, alis lateralibus duabus filiformibus elongatis ex ovario orientibus, petalis spathulatis et labello integro differt.

Type: *B. bisetum* Lindl., 1842.

Allied to *Bulbophyllum* sect. *Racemosas* Benth. & Hook.f. but differs in having unifoliolate pseudobulbs, two characteristic filiform long lateral projections (jugae) that arise laterally from the ovary, spatulate petals and an entire lip.

**Specimens of B. bisetum examined.** BHUTAN. Sarbhang district: Dara Chhu, 12 iii 1982, Grierson & Long 3695 (E).

INDIA. Sikkim, Rimi Chhu [Rungbee], ix 1892, Pantling 192A (K, W); Sikkim, Unlocalized, ix 1893, Pantling 192B (BM); Darjeeling, x 1881, Gamble 9881 (K); Khasia, Griffith s.n. (K-LINDL); Khasia, Clarke 6448 (K); Khasia, Churra, Griffith Kew. Dist. 5140 (K); Khasia, Hooker & Thomson Herb. Ind. Or. 23 (K); Khasia, Hooker 49 (K-LINDL).

*Bulbophyllum bisetum* Lindl. has been treated within section *Racemosas* Benth. & Hook.f. but it is easily distinguished from that section by the two characteristic filiform long lateral projections (jugae) that arise laterally from the ovary.

Seidenfaden (1970) commented that his *B. bisetoides* has features closer to section *Desmosanthes* but ‘the distinct setae place it near *B. bisetum*’ and he used this sectional name with a note that its description was in preparation (Seidenfaden, 1992).

**Bulbophyllum** section *Henosis* (Hook.f.) P. Ormerod, **comb. et stat nov.**


**Specimens of B. longipes examined.** BHUTAN. Deothang district: Deothang [Dewangiri], Griffith 65 (K-LINDL); Deothang [Dewangiri], Griffith Kew. Dist. 5133 (K); Upper Phu Chu district: Samadingkha, 3 i 1994, D.B. Gurung 32 (Herb. D. B. Gurung).

INDIA. E Bengal, Khasia, Griffith Kew. Dist. 5134 (K, W); Khasia, Jowye, Clarke 42549 (K); Sikkim, Engo, xii 1896, Pantling 357 (BM, K).

MYANMAR. Moulmein, Lobb s.n. (K-LINDL).

J. D. Hooker (1890) established the genus *Henosis* with the transfer from *Bulbophyllum* of *B. longipes*. He distinguished it from *Bulbophyllum* in having the lateral sepals at the apex of the elongate column-foot, the hyaline petals decurrent on the column-foot, and a villose lip. Hooker also thought that *B. gymnopus* Hook.f. and *B. wrayii* Hook.f. belonged to the same group. Garay et al. (1994) transferred *H. longipes* to *Monomeria* and *B. gymnopus* to *Dymoda*. We consider that *B. longipes* and *B. gymnopus* are too closely related to justify this separation. Ormerod (personal communication) suggested treating them as a section within *Bulbophyllum* but has not published a sectional name. Until further studies have resolved the many problems within the *Bulbophyllum* alliance, nomenclatural stability is better served by treating these species in a new section under *Bulbophyllum*. 

Bulbophyllum section Reptantia J. J. Vermeulen, sect. nov.
Sectioni Careyanis affinis sed rhizomate filiformi ramificanti, folio unico, inflorescentia laxe multiflora, et labello integro distinguenda.
Type: B. reptans (Lindl.) Lindl., 1830.

Allied to Bulbophyllum sect. Caryana Pfitz. but with a branching filament rhizome, unifoliate pseudobulbs, lax many-flowered inflorescences and flowers with an entire lip.

Specimens of B. reptans examined. BHUTAN. Tongsa district; Tashiling [Tassuling], Griffith 31 (K-LINDL); Tongsa, 6 iv 1982, Grierson & Long 4362 (K, E); Tashigang district: Tashi Yangtsi, Lichang, 30 v 2000, Dorji, Pearce & Cribb 74 (THIM); Sakden district: Takhtoo, 16 iii 1936, Ludlow & Sherriff 1191 (BM, E); Unlocalized, 11 ii 1983, Grierson & Long 3239 (E).

INDIA. Sikkim, Bakhim [Buckeen], 12 x 1875, Clarke 25308 (BM, K, W); Dingling, 29 xi 1871, Clarke 14814 (E, K, W); Kalej Khola [Kuhart], 11 x 1870, Clarke 13010 (K, W); Unlocalized, ii 1891, Pantling 7A (BM, E, K); Unlocalized, 23 x 1974, Teutler 980 (K); Darjeeling: Sureil, ii 1893, Pantling 7B (K, W); Unlocalized, Griffith s.n. (W); Khasia, Griffith Kew. Dist. 5130 (K, W).

NEPAL. Mewa Khola, 4 xi 1975, Beer 25703 (BM); Unlocalized, Rudge s.n. (holo. K-LINDL).

Bulbophyllum reptans (Lindl.) Lindl. has usually been included within section Careyana Pfitz. However, it differs from other species of that section in having a racemose laxly-flowered inflorescence. Jaap Vermeulen (personal communication) proposed this new section for B. reptans and Seidenfaden (1992) used the sectional name with a note that its formal description was in preparation.

Bulbophyllum section Striata J. J. Vermeulen, sect. nov.
Sectioni Racemosis affinis sed folio unico longe petiolato, inflorescentia 2- vel 4-flora, floribus purpureo-striatis, petalis trivenosis et labello ad basin biauriculato distinguenda.
Type: B. striatum (Griff.) Rchb.f., 1861.

Allied to Bulbophyllum sect. Racemosa Benth. & Hook.f. but distinguished by its unifoliate pseudobulbs, longly petiolate leaf, 2–4-flowered inflorescences, purple-striped flowers, trinerved petals and lip that is biauriculate at the base.


INDIA. Assam, Mumbree, 11 xi 1836, Griffith 236/146 (holo. K-LINDL); Sikkim, x 1893, Pantling 298 (BM, K, W).

Bulbophyllum striatum (Griff.) Rchb.f. has formerly been included in section Racemosa Benth. & Hook.f., while Seidenfaden (1982) was unsure whether his B. striatitepalum, a closely related species, belonged within section Desmosanthes or in section Racemosa, having features of both. Vermeulen (personal communication)
suggested that they warranted a new section. Both *B. striatum* and *B. striatitipalum* are distinguished by their long petioles, purple-striped flowers and a bi-auriculate lip.

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**References**


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