

Enumeration

The Orchid species and generic legitimate name as per the latest nomenclature code, through proper taxonomic treatment of species, collected from Darjeeling Himalaya has been arranged in compliance with the classification presented by King & Pantling, 1898, R. L. Dressler, 1993 and Pearce & Cribb, 2002. The following sequence of enumeration is taken into consideration while enumerating each identified species.

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(i) Legitimate correct name, (ii) Basionym, (iii) Synonyms, (iv) Protologue and other important publication references, (v) Description, (vi) Flowering and fruiting periods, (vii) Specimen cited with altitude (vii) Status, (viii) Local distribution, (ix) General distribution and important note if any on floral morphology and colour variation of the taxa.

4.1. Determination of present availability status in the natural habitats

The present availability status of species in the natural habitat is actually being determined through the eye estimation and through the consultation of Red Data List of IUCN (2003) and Botanical Survey of India.

4.2. Abbreviations Used in Enumeration

Except where unavoidable, attempt has been made to use minimum abbreviations. The following abbreviations have been used in this flora:

Authorities of Botanical names

Andr.	: Andrews
A. Rich.	: A. Richard
Balacr. & Chowdh.	: Balakrishnan & Chowdhery
Benth.	: Bentham
Blatt.	: Blatter
Bl.	: Blume
Buch.-Ham.	: Buchanan-Hamilton
Commers.	: Commerson
D. Don	: Davis Don
Falc.	: Falconer
Gaud.	: Gaudichaud
Gagnep.	: Gagnepain
Griff.	: Griffith
Herit.	: Heritier
Hochr.	: Hochreutiner
Holt.	: Holtum
Hook. f.	: J. D. Hooker (fil.)
J.E. Sm.	: J.E. Smith
J.J. Sm.	: J.J. Smith
Ker-Gawl.	: Ker Gawler
King & Pantl.	: King & Pantling
Ktze.	: Kuntze
L.	: C. Linnaeus
Lamk.	: Lamarck
Lind.	: Lindley
Lour.	: Loureiro

Lucksom	: S.Z. Lucksom
Paxt.	: Paxton
Pearce & Cribb	: N. Pearce & P.J. Cribb
Par.	: Parish
Pers.	: Person
Pfitz.	: Pfitzer
Rchb. f.	: Reichenbach fil.
Rich.	: L.C. Richard
Ridl.	: Ridley
R. Br.	: Robert Brown
Roxb.	: Roxburgh
Schltr.	: Schlechter
Seidenf.	: Seidenfaden
Soland.	: Solander
Spreng.	: Sprengel
Steud.	: Steudel
Summerh.	: Summerhayes
Sw.	: Swartz
Tang & Wang	: T. Tang & F.T. Wang
Thour.	: Thouars
Thumb.	: Thunberg.
Trim.	: Trimen
W.W. Sm.	: W.W. Smith
Wall.	: Wallich
Willem.	: Willemet
Willd.	: Willdenow
William	: B.S. William

4.3. Order, Family, Subfamily, Tribe, Subtribe of Orchid Genera

In the present context of knowing the Orchid Flora of Darjeeling Himalaya, King & Pantling, 1898, R. L. Dressler, 1993 and Pearce & Cribb, 2002 system of classification have been adopted with some modification. Orchid Flora of Darjeeling Himalaya have been classified into following Order, Family, Subfamily, Tribe, Subtribe and Genus.

Order **Orchidales**

Family **Orchidaceae** A. Juss.

Orchids with 2 or 3 fertile anthers

1. Sub family **Cyperipedioideae** Lindl.

Tribe **Apostasiae**

Subtribe **Paphiopedilinae**

Paphiopedilum Pfitz.

Primitive Orchids with a single fertile anther

Tribe **Gastrodieae**

Subtribe **Gastrodiinae**

Didymoplexis Griff.

Tribe **Nervilieae** Dressler

Nervilia Commer. & Gaud.

Tribe **Vanilleae** Lindl.

Subtribe **Galeolinae** Garay

Galeola Lour.

2. Sub family **Spiranthoideae** Dressler

Tribe **Cranichideae** Endlicher

Subtribe **Goodyerinae** Klotzsch

Anoetochilus Bl.

Goodyera R. Br.

Herpysma Lindl.

Cheirostylis Bl.

Odontochilus Bl.

Rhomboda Lindl.

Zeuxine Lindl.

Subtribe Spiranthinae Lindl.	Spiranthes Rich.
Subfamily Orchidoideae	
Tribe Orchideae	
Subtribe Orchidinae	
	Gymnadenia R. Br.
	Habenaria Willd.
	Herminium L.
	Peristylus Bl.
	Platanthera Rich.
Tribe Diseae Dressler	
Subtribe Satyriinae Schltr.	Satyrium Sw.
Subtribe Diplomeridinae	Diplomeris D. Don
3. Subfamily Epidendroideae Lindl.	
Tribe Malaxideae Lindl.	Liparis Rich.
	Malaxis Soland.
	Crepidium Bl.
	Denia Lindl.
	Oberonia Lindl.
Tribe Calypsoeae Dressler	Cremastra Lindl.
	Tipularia Nuttall.
Tribe Cymbidieae Pfitz.	
Subtribe Eulophiinae Benth.	Eulophia R. Br. <i>ex</i> Lindl.
	Geodorum Jackson
Subtribe Cyrtopodiinae Benth.	Cymbidium Sw.
Tribe Arethuseae Lindl.	
Subtribe Bletiinae Benth.	Acanthephillium Bl.
	Anthogonium Wall. <i>ex</i> Lindl.
	Calanthe R. Br.

	Phaius Lour.
Subtribe Collabiinae Schltr.	Chrysoglossum Bl. Nephelaphyllum Bl. Tainia Bl.
Tribe Coelogyneae	
Subtribe Arundinae	Arundina Bl.
Subtribe Thuniinae	Thunia Rchb. f.
Subtribe Coelogyneae Benth.	Coelogyne Lindl. Otochilus Lindl. Panisea (Lindl.) Steud. Pholidota Lindl. <i>ex</i> Hook. Pleione D. Don
Tribe Podochileae Pfitz.	
Subtribe Agrostophyllinae Szlach.	Agrostophyllum Bl.
Subtribe Eriinae Benth.	Ceratostylis Bl. Cryptochilus Wall. Pinalia Lindl. Eria Lindl. Porpax Lindl. Trichotosia Bl. Tylostylis Hook. f.
Sub tribe Podochilinae	Appendicula Bl. Podochilus Bl.
Sub tribe Thelasiinae Schltr.	Phreatia Lindl. Thelasis Bl.
Tribe Dendrobieae Endlicher	

Subtribe **Dendrobiinae** Lindl.

Dendrobium Sw.

Epigeneium Gagnep.

Flickingeria A.D. Hawkes

Subtribe **Bulbophyllinae** Schltr.

Acrochaene Lindl.

Bulbophyllum Thou.

Monomeria Lindl.

Sunipia Lindl.

4. Sub family **Vandoideae** Endlicher

Tribe **Vandae** Lindl.

Subtribe **Aeridinae** Pfitz.

Acampe Lindl.

Aerides Lour.

Ascocentrum Schltr.

Biermannia King & Pantl.

Chilochista Lindl.

Cleisocentron Bruhl

Cleisostoma Bl.

Esmeralda Rchb. f.

Gastrochilus D. Don

Luisia Gaud.

Micropera Lindl.

Ornithochilus (Lindl.) Benth.

Papilionanthe Schltr.

Pelatantheria Ridl.

Phalaenopsis Bl.

Pomatocalpa Breda

Pteroceras Hasskarl

Rhynchostylis Bl.

Saccolabiopsis J.J. Sm.

Smitinandia Holtt.

Stereochilus Lindl.

Uncifera Lindl.

Vanda Jones *ex* R. Br.

Vandopsis Pfitz.

4.4. Key to Genera

- 1. Plants saprophytic2
- 1a. Plants not saprophytic3

- 2. Plant small; rootstock tuberous
 moniliform; sepals and petals united **Didymoplexis**
- 2a. Plant large; rootstock not tuberous
 moniliform; sepals and petals free**Galeola**

- 3. Plant terrestrial4
- 3a. Plant epiphytic37

- 4. Anther 2**Paphiopedilum**
- 4a. Anther solitary.....5

- 5. Pollinia 8.....6
- 5a. Pollinia 2 or 4 12

- 6. Leaves distichous, not plaited.....7
- 6a. Leaves not distichous, plaited8

- 7. Lip spurred **Thunia**
- 7a. Lip not spurred**Arundina**

- 8. Sepals connate into a broad, fleshy cup**Acanthephippium**
- 8a. Sepals not as above.....9

- 9. Leaf solitary.....**Tainia**
- 9a. Leaves solitary-many10

10. Column 2 winged.....	Nephelaphyllum
10a. Column not as above	11
11. Lip jointed to half or whole length of the column.....	Calanthe
11a. Lip free or slightly spurred.....	Phaius
12. Flower 1 or 2, spurred.....	Diplomeris
12a. Flowers more than 2	13
13. Sepals connate in a gibbous tube	Cheirostylis
13a. Sepals not connate and tube not gibbous.....	14
14. Pollinia 4.....	15
14a. Pollinia 2.....	21
15. Column very short	16
15a. Column long	18
16. Lip 3-lobes, clawed	Dienia
16a. Lip not 3-lobed, not clawed.....	17
17. Basal lip auricle absent	Malaxis
17a. Basal lip auricles large and long	Crepidium
18. Leaves plaited	19
18a. Leaves not plaited	Liparis (in part)
19. Column 3-lobed or toothed; lip not spurred.....	20
19a. Column neither lobed nor toothed; lip spurred	Tipularia
20. Sepals connate into a tube; pollinia mealy, soft	Anthogonium

20a. Sepals not connate; pollinia firm or hard	Cremastra
21. Plants pseudobulbous	Chrysoglossum
21a. Plants not pseudobulbous	22
22. Plant tuberous	23
22a. Plant non tuberous	32
23. Inflorescence twisted spike.....	Spiranthes
23a. Inflorescence not twisted	24
24. Tuber palmate.....	Gymnadenia
24a. Tuber entire.....	25
25. Leaf solitary	Nervilia
25a. Leaves 2-many.....	26
26. Leaves plaited	27
26a. Leaves not plaited	28
27. Lip spurred	Eulophia
27a. Lip not spurred	Geodorum
28. Lip not spurred	Herminium
28a. Lip spurred.....	29
29. Lip with 2 spurs	Satyrium
29a. Lip with 1 spur.....	30
30. Stigma 1-lobe.....	Platanthera
30a. Stigma 2-lobes	31

31. Spur short; stigma lobes appressed or connate to the hypochile of lip	Peristylus
31a. Spur usually long; stigma lobes not adnate to hypochile	Habenaria
32. Column with 2 wing like keels on front	33
32a. Column lacking wing-like keels on front	35
33. Lip spurred at base	Anoectochilus
33a. Lip not spurred but saccate	34
34. Hypochile of lip small, saccate; mesochile of lip toothed or simple	Odontochilus
34a. Hypochile of lip large, saccate; mesochile of lip untoothed	Rhomboda
35. Stigmas united or undivided under the rostellum.....	36
35a. Stigmas 2, separated on each side of the rostellum	Zeuxine
36. Lip not spurred, hypochile hairy within	Goodyera
36a. Lip spurred, lacking hairs within	Herpysma
37. Plants without pseudobulb.....	38
37a. Plants with pseudobulb	71
38. Leaves absent	Chiloschista
38a. Leaves present	39
39. Leaves linear or terete	40
39a. Leaves flat, or sulcate or subterete	45
40. Lip without spur	41

40a. Lip with a small spur	44
41. Stem fleshy; inflorescence terminal racemes	42
41a. Stem woody; inflorescence extra axillary, condensed spike	Luisia
42. Pseudobulb many-joined	Pinalia
42a. Pseudobulb 1 or 3 joined	43
43. Lip immobile, 3-lobed; disc with callus.....	Eria
43a. Lip mobile, not lobed; disc devoid of any callus.....	Tylostylis
44. Leaves terete; column with a long foot	Papilionanthe
44a. Leaves generally linear; column with a short foot	Aerides
45. Plants more than 10 cm (10-255 cm) long, if less then leaves equitant (<i>Podochilus</i>).....	46
45a. Plants short, less than 10 cm (1.5-8.5 cm) long (sometimes more than 10 cm in <i>Podochilus</i> but flowers minute).....	64
46. Pollinia 8 or 4.....	47
46a. Pollinia 2.....	58
47. Pollinia 8.....	48
47a. Pollinia 4.....	49
48. Leaves many, distichous; flowers in terminal heads	Agrostophyllum
48a. Leaf solitary; flowers from the leaf joints or side of leaf base	Ceratostylis
49. Lip not spurred.....	50
49a. Lip distinctly spurred or saccate at base	55

50. Flowering terminal	51
50a. Flowering not terminal	52
51. Plant small, flowers upto 3-6 mm long	Podochilus
51a. Plant large, flowers 4-8 mm long	Appendicula
52. Stem more than 90 cm long.....	53
52a. Stem less than 55 cm long	54
53. Flowers large, 5-8 cm across, transversely streaked; lip pendent.....	Esmeralda
53a. Flowers smaller, 0.7-2 cm across, not streaked; lip attached	Micropera
54. Stem stout, 20-50 cm long, minutely warted; flowers large, about 5 cm across.....	Vandopsis
54a. Stem scandent, 7-25 cm long, not warted; flowers small, about 1.25 cm across.....	Pteroceras
55. Lip saccate at base	Acampe
55a. Lip distinctly spurred.....	55
56. Inflorescence glandular-pubescent	Stereochilus
56a. Inflorescence not pubescent	57
57. Stem erect or pendulous; leaves flat or terete; spur longitudinally septate	Cleisostoma
57a. Stem always pendent; leaves linear, lanceolate; spur not longitudinally septate.....	Smitinandia
58. Leaves acute or acuminate; lip subglobose or	

bell shaped, saccate at base; apical lobe fimbriate	Gastrochilus
58a. Leaves 2-lobed at tip; lip not bell shaped, spurred; apical lobe not fimbriate.....	59
59. Stem always pendulous; spur long, funnel shaped; column long	Cleisocentron
59a. Stem erect, sometimes pendulous; spur and column short	60
60. Leaves 2-lobed at tip	61
60a. Leaves bifid at tip	62
61. Inflorescence pendent; column long foot	Rhynchosyilis
61a. Inflorescence short, not pendent; column without foot	Pelatantheria
62. Inflorescence pendent	Uncifera
62a. Inflorescence not pendent	63
63. Flowers less than 2.5 cm across; stipe narrow	Ascocentrum
63a. Flowers more than 2 cm across; stipe broad	Vanda
64. Leaves equitant, ensiform	Oberonia
64a. Leaves distichous, linear-oblong, obovate or orbicular	65
65. Caespitose herbs with creeping rhizomes	66
65a. Herbs not caespitose without creeping rhizomes	67
66. Pubescent herbs; leaves in rosette, orbicular	Trichotosia
66a. Glabrous herbs; leaves distichous, linear	Phreatia
67. Lip spurred	68
67a. Lip not spurred	70

68. Side lobes of lip pectinate	Ornithochilus
68a. Side lobes of lip not pectinate	69
69. Side lobes of lip obscure	Pomatocalpa
69a. Side lobes of lip prominent	Saccolabiopsis
70. Leaves oblong or obovate	Phalaenopsis
70a. Leaves linear	Biermannia
71. Pollinia 2.....	72
71a. Pollinia 4 or 8	73
72. Pseudobulb with solitary leaf.....	Acrochaene
72a. Pseudobulbs more than 2 leaves	Cymbidium
73. Pollinia 8.....	74
73a. Pollinia 4.....	75
74. Pseudobulbs discoid; flowers 1-2	Porpax
74a. Pseudobulbs ovoid or cylindrical; flowers more than 5	Cryptochilus
75. Flowers very small.....	Thelasis
75a. Flowers larger.....	76
76. Bracts distichous	Pholidota
76a. Bracts not distichous.....	77
77. Inflorescence distinct from the pseudobulb.....	78
77a. Inflorescence attached, lateral on leafy or leafless stem or from the base or top of pseudobulbs or flower solitary, terminal or subterminal	81

78. Flowers in racemes; petals reduced, fimbriate	Monomeria
78a. Flowers umbellate or spicate;	
petals prominent (minute in spicate).....	79
79. Pseudobulbs 2-leaves; leaves plaited	Panisea
79a. Pseudobulbs 1-2 leaved; leaves not plaited.....	80
80. Flowers concealed by the concave bracts;	
anther turned away from the rostellum	Sunipia
80a. Flowers not concealed by bracts;	
anther not turned away from the rostellum	Bulbophyllum
81. Pollinia usually clavate or oblique	Liparis
81a. Pollinia oblong	82
82. Leaf solitary	83
82a. Leaf solitary or more, leafless during flowering	84
83. Inflorescence subtended by papery	
scale leaves; flowers ephemeral	Flickingeria
83a. Inflorescence subtended by a	
spathaceous bract; flowers not ephemeral	Epigeneium
84. Flowers solitary or two..	Pleione
84a. Flowers more than two	85
85. Pseudobulbs forming a chain	Otochilus
85a. Pseudobulbs not forming a chain	86
86. Column produced into a foot	Dendrobium
86a. Column not produced into a foot	Coelogyne

4.5. ENUMERATION OF THE ORCHID FLORA OF DARJEELING HIMALAYA

Subfamily **Cypripedioideae** Lindl.

Tribe **Apostasieae**

Subtribe **Paphiopedilinae**

Paphiopedilum Pfitz.

Plants perennial terrestrial or lithophytic herbs. Stem very short. Leaves 4-8, distichous, conduplicate, ovate-elliptic, acute, tip minutely 2 or 3 lobed, coriaceous, green or mottled with darker green. Inflorescence terminal, solitary to several-flowered. Flowers showy, long lasting, fascinating array of colours and forms. Dorsal sepals erect; lateral pair united to form a synsepal. Petals spreading. Lip saccate; side lobes incurved, sometimes auriculate, apical margins usually not incurved. Column short, shield-shaped staminode at apex. Anther 2; pollinia 2.

The genus *Paphiopedilum* Pfitz., comprises about 70 species found in India, Myanmar, South East Asia, South West China, Indonesia, the Philippines, New Guinea, and the Solomon Islands.

Key to the species

1. Leaves green 2
- 1a. Leaves green, tessellated.....*P. venustum*

2. Dorsal margin of petals nearly straight.....3
- 2a. Dorsal margin of petals prominently undulate.....4

3. Dorsal sepal elliptic, 5.5-7 cm long,
ochraceous pale-green with purplish black deflexed base.....*P. villosum*
- 3a. Dorsal sepal elliptic-oblong, 5.7-6.7 cm long, white to
greenish-white, spotted sparsely
or densely with purplish-black.....*P. insigne*

4. Tip of dorsal sepal 2-lobed *P. hirsutissimum*
- 4a. Tip of dorsal sepal not 2-lobed 5

5. Dorsal sepal orbicular-ovate, white,
reticulated and flushed with purplish-red lines;

- petals 3.4- 4.5 cm long, falcate.....*P. fairrieianum*
 5a. Dorsal sepal orbicular, pure white
 with green base and broad median purple band;
 petals 3.5-4 cm long, not falcate.....*P. spicerianum*

Paphiopedilum fairrieianum (Lindl.) Stein, Orchid.-Buch: 467. 1892. Hook. f., Fl. Brit. India 6: 173. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 1: 39. 1976; Hedge, Orch. Arun. Pradh. 33. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 100. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 566. 1998; Bose *et al.* Orch. India. 370. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 26. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 26-27. 2005; *et* 100 N.E. Indian Orch. 26-27. 2006; Lucksom, Orch. Sikkim N.E. Himal. 7. t. 16, pl. 1. 2007; Misra, Orch. India. 311. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 14. 2012.

Cypripedium fairrieianum Lindl., Gard. Chron. 1857: 740. 1857. [Fig. 4.1]

Plant terrestrial herb, 20-28 cm tall. Stem 2-3 cm long, sheathed. Leaves 4-8, 9-22 × 2.5-3.5 cm, linear-oblong, acute, obtuse. Inflorescence solitary (rarely 2) flowered; peduncle 10-24 cm long, slender with purplish hairs; pedicel and ovary hairy. Flower solitary, 6-8.5 cm across, attractive; floral bracts pubescent. Sepals white, veined green and purple, dorsal suffused with purple; lip yellow-green to olive with dark veining. Dorsal sepal 3.5-4.5 × 3.5-4 cm, elliptic, obtuse, ciliate, flushed with purplish-red lines, side margins wavy; synsepal 2.5-3.5 × 2-2.4 cm, ovate, obtuse. Petals 3.4-4.5 × 1-1.3 cm, narrowly oblong, acute, falcate, undulate and purple-ciliate on the margins. Lip 3.5-4 × 1.8-2.5 cm, slipper-shaped, shortly apiculate and outcurved at apex. Column 6.5-7.5 mm long; staminode 3; stigma round.

- Flowering : October – March; Fruiting: December – April.
 Specimen cited : Nurserymen’s Heaven, Holumba Floral Nursery, –
 Kalimpong 980 m, **Rajendra Yonzon, D. Lama
 and R. B. Bhujel 1739**, dt. 23. 11. 2011.
 Status : Cultivated.
 Local distribution : Kaneybreed Floral Nursery, Kalimpong, National
 Research Centre for Orchids, Indian Council of
 Agricultural Research, Darjeeling, Lloyd Botanical
 Garden, Darjeeling, 850 – 2200 m.
 General distribution : India (Sikkim, Arunachal Pradesh, Assam); Bhutan.

Paphiopedilum hirsutissimum (Lindl. *ex* Hook.) Stein, Orchideenbuch, 470. 1892; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 1: 39. 1976; Pradhan & Pradhan, 100 Beaut. Orch. 101. 1997; Bose *et al.* Orch. India. 370. 1999; M. Pradhan, 100 N.E. Indian Orch. 28-29. 2006; Lucksom, Orch. Sikkim N.E. Himal. 8. t. 18, pl. 1. 2007;

Misra, Orch. India. 311. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 14. 2012.

Cypripedium hirsutissimum Lindl. *ex* Hook., Bot. Mag. 83: ad t. 4990. 1857.

Plant terrestrial herb, 15-31 cm tall. Leaves 4-7, 12-30 × 2.2-3.5 cm, oblong to linear-lanceolate, notched tip, distichous. Inflorescence solitary or rarely 2-flowered; peduncle 9-17 cm long, pedicellate-ovary 6-8 cm long. Flowers 9-12 cm across, pale-green with dark purple hirsute hairs; floral bracts orbicular-ovate. Sepals with hirsute hairs; dorsal sepal 4-4.2 × 3.5-4 cm, keeled, tip 2-lobed; pale-green, centrally spotted with dark-purple, margin undulating; synsepal 4-4.5 × 2.2-2.5 cm, elliptic-oblong, obtuse, pale-green. Petals 6.5-7 × 1.5-2.1 cm, spatulate, obtuse, obovate-oblong, basal margin wavy, pale green spotted with dark-purple. Lip 4.2-4.7 cm long, green spotted with dark-purple; staminode quadrate green.

Flowering : February – April; Fruiting: March – June.

Specimen cited : Kaneybreed Floral Nursery – Kalimpong 970 m.
Rajendra Yonzone, D. Lama and R. B. Bhujel
1109, dt. 26. 03. 2010.

Status : Cultivated.

Local distribution : Nurserymen's Heaven, Holumba Floral Nursery – Kalimpong, National Research Centre for Orchids, Indian Council of Agricultural Research, Darjeeling Campus and Lloyd Botanical Garden, Darjeeling, 850 – 2300 m.

General distribution : India (Meghalaya, Nagaland and Mizoram).

Paphiopedilum insigne (Wall. *ex* Lindl.) Pfitz., Morph. Stud. Orchideenbl. 11. 1886. Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 1: 37. 1976; Bose *et al.* Orch. India. 370 & 372. 1999; M. Pradhan, 100 N.E. Indian Orch. 30-31. 2006; Lucksom, Orch. Sikkim N.E. Himal. 6-7. t. 15, pl. 1. 2007; Misra, Orch. India. 311. 2007; Yonzone *et al.* Int. J. of Pharm. Life Sci. 3(3): 1536. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 14. 2012.

Cypripedium insigne Wall. *ex* Lindl., Coll. Bot. ad t. 32. 1821. [Plate 4.1]

Plant terrestrial herb, 14-35 cm tall. Stem 2-4 cm long. Leaves 5-6, 6-30 × 1.7-3.5 cm, broadly linear, pale green, tip unequally 2-lobed. Inflorescence 13.5-30 cm long, solitary flowered; peduncle 8-20 cm long; pedicellate-ovary 5.3-8 cm long. Flowers 7-8 cm across, spreading; floral bracts 4-5 cm long. Sepals pale-green, many-nerved; dorsal sepal 5.7-6.7 × 3.8-4 cm, elliptic-oblong, erect, margin undulating and hairy, white to greenish-white, dark purple spots; synsepal 4.6-5.5 × 2-2.5 cm, oblong, the inner margin adnate to each other below lip, pale green, dark-purple spots on the nerved. Petals 5.6-6.4 × 1.5-1.8 cm, linear-oblong, glabrous with undulate margin, yellowish-green, shaded with brownish purple. Lip 4-5 cm long, pale-green,

brownish purple reticulate nerves. Column 1.9-2 cm long, puberulous; staminodes elliptic; stigma ventral obscurely lobed.

- Flowering : November–January; Fruiting: December–February.
Specimen cited : Kaneybreed Floral Nursery – Kalimpong, 970 m.
Rajendra Yonzone, D. Lama and R. B. Bhujel 1529, dt. 16. 12. 2010.
Status : Cultivated.
Local distribution : Nurserymen’s Heaven, Holumba Floral Nursery -
Kalimpong, National Research Centre for
Orchids, Indian Council of Agricultural Research
and Lloyd Botanical Garden – Darjeeling,
850–2300 m.
General distribution : India (Meghalaya).

Paphiopedilum spicerianum (Rchb. f. ex Masters & T. Moore) Pfitz., *Johrb. Wiss. Bot.* 19: 164. 1888; Lucksom, *Orch. Sikkim N.E. Himal.* 7-8. t. 17, pl. 1. 2007.
Cypripedium spicerianum Rchb. f. ex Masters & T. Moore, *Gard. Chron.* B.S. 12: 505. 1879.

Plant terrestrial herb, 18-37 cm tall. Leaves 4-5, 10-33 × 2.5-4.5 cm, linear-oblong, obtuse, tip obliquely 2-dentate, dark-green. Inflorescence 15-34 cm long, erect, dark purple, hairy; peduncle 10-28 cm long; pedicellate-ovary 3-5 cm long. Flowers 5-7 cm across, green; floral bracts pale-brown. Sepals sub-equal; dorsal sepal 3-4 × 3.5-4.5, elliptic-ovate, obtuse to retuse with central dark purple vein; synsepal 2.8-3.5 × 1.8-2.3 cm, oblong-ovate to elliptic-oblong, pale whitish-green. Petals 3.5-4 × 0.8-1.4 cm, narrowly oblong, slightly twisted, upper margin undulate and hairy. Lip 3.5-4.5 × 2.5-3 cm, pale, suffused with brown; staminode elliptic-obcordate, purple suffused with white.

- Flowering : September – December; Fruiting: November – January.
Specimen cited : Nurserymen’s Heaven, Holumaba Floral Nursery
– Kalimpong 980 m, **Rajendra Yonzone, D. Lama
and R. B. Bhujel 2616**, dt. 26. 11. 2014.
Status : Cultivated.
Local distribution : National Research Centre for Orchids, Indian
Council of Agricultural Research, Darjeeling
Campus, 850 – 2300 m.
General distribution : India (North East, Mizoram, Manipur); Bhutan
and North West Myanmar.

Paphiopedilum venustum (Wall.) Pfitz. ex Stein, Orchid.-Buch: 489. 1892. Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 1: 40. 1976; Pradhan & Pradhan, 100 Beaut. Orch. 102. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 566-568. 1998; Bose *et al.* Orch. India. 372. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 28. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 28-29. 2005; *et* 100 N.E. Indian Orch. 34-35. 2006; Lucksom, Orch. Sikkim N.E. Himal. 8-9. t. 19, pl. 1. 2007; Misra, Orch. India. 311. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 14. 2012.

Cypripedium venustum Wall., Bot. Mag. 47: t.2129. 1820.

Plant terrestrial herb, 28-36 cm tall. Leaves 4-5, 10-25 × 3-5.5 cm, elliptic-oblong, thick, grayish-green above, purple mottled beneath, tip acutely 2-lobed. Inflorescence solitary flowered; peduncle 10-23 cm long, hirsute; pedicel and ovary 3.5-5.5 cm long, hairy, green spotted with purple. Flowers 7-9.5 cm across, whitish-green; floral bract elliptic-lanceolate. Dorsal sepal 2.8-3.7 × 2-2.8 cm, broadly ovate or cordate, acute, green veined; synsepal 2-2.9 × 1.3-1.7 cm, oblong-ovate, concave. Petals 4-5.3 × 1.2-1.5 cm, recurved, linear-oblong, green and purple with black spots, obtuse, ciliate. Lip 3.3-4.3 × 2.5-3.2 cm, slipper-shaped, side lobes reniform, hairy. Column 8-9 mm long, terete.

Flowering	: March – May; Fruiting: April – June.
Specimen cited	: Nurserymen’s Heaven, Holumba Floral Nursery – Kalimpong 980 m, Rajendra Yonzon, D. Lama and R. B. Bhujel 1539 , dt. 16. 02. 2011.
Status	: Cultivated.
Local distribution	: National Research Centre for Orchids, Indian Council of Agricultural Research, Darjeeling Campus, Kaneybreed Floral Nursery, Kalimpong, 850 – 2300m.
General distribution	: India (North East India, Meghalaya); Bangladesh, China, Nepal.

Paphiopedilum villosum (Lindl.) Pfitz., Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 1: 37. 1976; Bose *et al.* Orch. India. 372. 1999; M. Pradhan, 100 N.E. Indian Orch. 36-37. 2006; Lucksom, Orch. Sikkim N.E. Himal. 6. t. 14, pl. 1. 2007; Misra, Orch. India. 311. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 14. 2012.

Cypripedium villosum Lindl., Gard. Chron. 1854, 125.

C. boxalli Reichb. f., Gard. Chron. 1877, i. 367; I 11. Hort. xxvi.345.

Plant terrestrial herb, 18-37 cm tall. Stem 2-3 cm long. Leaves 3-6, 8-33 × 2.7-3.4 cm, narrowly elliptic-oblong, subacute. Inflorescence solitary, terminal, peduncle 8-19 cm long, with whitish-purple hairs, with a single flower; pedicellate-ovary 4-5.5

cm long, ribbed. Flowers 8-11 cm across, spreading, ochraceous-yellow, with - purple nerves; floral bracts elliptic-oblong. Dorsal sepal 5.5-7 × 3.8-4.2 cm, elliptic dark, subacute, erect; synsepal 6-6.5 × 2.5-2.8 cm, externally pubescent, both inside and outside pale yellow. Petals 6.5-7 × 3.1-3.5 cm, spathulate or obovate, subacute, margin ciliate. Lip 4.5-5.5 × 2.5-3 cm, glossy, pointed below, ochraceous yellow, reticulated with purplish-brown nerves, glabrous. Column 2- 2.3 cm long; staminode slightly 2-lobes.

Flowering	: January – March; Fruiting: February – April.
Specimen cited	: Kaneybreed Floral Nursery – Kalimpong 970 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1546 , dt. 24. 02. 2011.
Status	: Cultivated.
Local distribution	: National Research Centre for Orchids, Indian Council of Agricultural Research, Darjeeling. Lloyd Botanical Garden, 850 – 2300 m.
General distribution	: India (Assam, Meghalaya); Burma.

Tribe **Gastrodieae** Lindl.

Subtribe **Gastrodiinae** Lindl.

Didymoplexis Griff.

Plants terrestrial, leafless, saprophytic herbs with tuberous roots. Inflorescence racemes, erect. Flowers small; pedicels elongate. Dorsal sepal and petals united by their margins into a short tube, their apices alone free, dorsal sepal and petals forming the upper 3-lobed lip, lateral pair forming the lower entire or bifid lip. Lip shorter than the perianth-tube, adnate to the foot of the column, entire. Column long, 2-winged, with a short foot basally; clinandrium entire, with elevated margins. Anther 2-celled; pollinia 4.

The genus *Didymoplexis* Griff., comprises about 20 species distributed in Tropical Africa, Madagascar, Asia, Malaysia and the adjacent Islands.

Didymoplexis pallens Griff., Calcutta J. Nat. Hist. 4: 383, t.17. 1844; Hook. f., Fl. Brit. India 6: 122. 1890; Hedge & Rao, J. Econ. Taxon. Bot. 4(2): 386. 1983; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 152-153. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 136, t. 137. 1976; Chowdhery, Orch. Fl. Arun. Pradh. 329. 1998; Bose *et al.* Orch. India. 219. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 30, t. 29. 2002; Lucksom, Orch. Sikkim N.E. Himal. 20. t. 28. 2007; Misra, Orch. India. 295. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1536.

2012; *et* McAllen Int. Orch. Soc. J., 13(4): 10. 2012; Misra, Orch. Odisha. 240-241. 2014.

Leucorchis sylvatica Bl., Mus. Bot. 1: 31. 1849.

Arethusa ecristata Griff., Not. Pl. Asiat. 3: 378. 1851.

Apetalon minutum Wight, Icon. Pl. Ind. Orient. 5: t.1758. 1852.

Epiphanes pallens (Griff.) Rchb. f., Seemann, Fl. Vit.: 296. 1868.

Gastrodia pallens (Griff.) f. Mueller, Contr. Phytogr. New Hebrides: 22. 1870.

Arethusa benghalensis Hort. *ex* Hemsley, J. Linn. Soc., Bot. 20: 311. 1884.

Didymoplexis subcampanulata Hayata, Icon. Pl. Formos. 2: 136. 1912.

Cheirostylis kanerensis Blatt. & McCann, J. Bombay Nat. Hist. Soc. 35: 732, f.4. 1932.

Didymoplexis brevipes Ohwi, Acta Phytotax. Geobot. 6: 238. 1937.

Plant terrestrial, saprophytic, leafless, 9-16 cm tall. Tubers 1.7-3.5 × 0.5-0.6 cm, moniliform. Stem 8-14 cm tall, erect, slender, glabrous, sheathed. Inflorescence laxly 3 to 7-flowered; pedicellate-ovary 0.7-1 cm long. Flowers 5-9 mm long, white, campanulate, bilabiate; floral bracts shorter than the ovary. Sepals sub equal, connate; dorsal sepal 8-9 × 1-2 mm, adnate to petals forming a hood, 3-lobed, obovate; lateral pair 6-8 × 6-8 mm, connate, with free portion reflexed, 2-lobed, lobes obtuse formed sepaline tube. Petals 4-6 × 4-5 mm, obliquely obovate. Lip 5-6 × 4-7 mm, short curved clawed, cuneately oblong, apex truncate, minutely erose, disc with minute granulations. Column 5-6 mm long, curved, clavate, apex winged. Anther cordate; pollinia 4.

Flowering : April – June; Fruiting: May – July.

Specimen cited : Namungay dara-Samalbong Busty 800 m,
Rajendra Yonzone, D. Lama and
R. B. Bhujel 0866, dt. 30. 05. 2009.

Status : Rare.

Local distribution : Relli – Pala, Najoke, Samthar, 300 – 2000 m.

General distribution : India (Sikkim, West Bengal); Afghanistan,
Australia, Japan, Malaysia, New Guinea, Philippines.

Tribe **Nervilieae** Dressler

Nervilia Commers. *ex* Gaud.

Plant terrestrial, tuberous herb. Tuber entire, globose. Leaf solitary, plicate, petiolate, surorbicular with cordate base, appearing after flowering. Inflorescence erect, racemes, hysteroanthous, solitary to several-flowered. Flowers not opening widely, pendent. Sepals and petals similar, lanceolate, acute. Lip erect, simple or 3-lobed.

Column elongate, clavate, wingless; clinandrium prominent, entire or denticulate.
Anther incumbent; pollinia 2.

The genus *Nervilia* Commers. ex Gaud., comprises about 80 species distributed in Tropical Africa, Madagascar, Tropical Asia, the Malay Archipelago, the Pacific Islands and North Australia.

Key to the species

1. Inflorescence with solitary flower..... *N. macroglossa*
- 1a. Inflorescence with 2 or more flowers.....2
2. Inflorescence with 2 or 3 flowers.....*N. plicata*
- 2a. Inflorescence with 3 or more flowers.....3
3. Sepals not more than 2.2 cm,
hypochole without a sac.....*N. aragoana*
- 3a. Sepals more than 2 cm long,
hypochole obscurely forming a sac.....*N. gammieana*

Nervilia aragoana Gaud., Freycinet, Voy. Uranie: 422, t.35. 1826; King & Pantl., Orch. Sikkim Himal. 89. 1898; Tuyama in Ohashi, Fl. E. Himal. 3: 162. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 1: 146. 1976; Deva & Naithani, Orch. N.W. Himal. 73–75. t. 74. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 526. 1998; Bose *et al.* Orch. India. 338. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 61. 2002; Luckson, Orch. Sikkim N.E. Himal. 57. t. 65, pl. 2. 2007; Misra, Orch. India. 308. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et Pleione.* 7(1): 148 – 149. 2013; Misra, Orch. Odisha. 166-167. 2014.

Epipactis carinata Roxb., Hort. Bengal.: 63. 1814; Fl. Ind. ed. 1832, 3: 454. 1832.

Pogonia carinata (Roxb.) Lindl., Gen. Sp. Orchid. Pl.: 414. 1840; Hook. f., Fl. Brit. India 6: 121. 1890.

P. flabelliformis Lindl., Gen. Sp. Orch. 415. 1840.

P. nervilia Bl. Mus. Bot. 1: 32. 1849.

P. scottii Rchb. f., Flora 55: 276. 1852; Bruhl, Guide Orch. Sikkim. 156. 1926.

P. gracilis Bl., Coll. Orchid.: 155, t.57, f.3 1858.

Nervilia scottii (Rchb. f.) Schltr., Bot. Jahrb. Syst. 45: 404. 1911; Banerji, Orch. Nepal. 42. 1982.

N. yaeyamensis Hayata, Icon. Pl. Formos. 2: 140. 1912.

N. tibetensis Rolfe, Notes Roy. Bot. Gard. Edinburgh 8: 128. 1913.

Aplostellis flabelliformis (Lindl.) Ridl., Fl. Malay. Penins. 4: 203. 1924.

Nervilia flabelliformis (Lindl.) Tang & Wang, Acta. Phytotax. Sin. 1: 68. 1951.

Plant terrestrial, tuberous herb, 20-37 cm tall. Leaf solitary, 5-14 × 5-11 cm, orbicular-cordate, rounded at base, plicate, petiolate. Inflorescence hysteroanthous,

erect, many-flowered; pedicellate ovary 0.8-1.2 cm long. Flowers 1.4-2 cm long, pale-green; floral bracts linear-lanceolate, longer than ovary. Sepals and petals similar, linear-lanceolate, acute, externally keeled; dorsal sepal 1.7-2.2 cm long; lateral pair 1.7-2.2 cm long. Petals 1.5-1.8 cm long, linear, narrowly obtuse. Lip 1.8-2.3 cm long, 3-lobed, minutely saccate at base, side lobes obtuse, hypochile without a sac; disc with three parallel hispid lamellae; apical lobe ovate, acute. Column 5-7 mm long, straight, clavate. Pollinia oblong conjoined, yellow.

Flowering	: March – May; Fruiting: April – June.
Specimen cited	: Latpanjar forest 800 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1568 , dt. 24. 04. 2011.
Status	: Sparse.
Local distribution	: Kumsi, Kalijhora, Teesta 27 th Mile, Sittong, Geilkhola, 450 – 1000 m.
General distribution	: India (Sikkim, West Bengal); Australia, China; Indonesia, Malaysia, Philippines, Samoa, Palau, New Guinea, South East Asia and Timor.

Nervilia gammieana (Hook. f.) Schltr., Bot. Jahrb. Syst. 45: 404. 1911; Hook. f., Fl. Brit. India 6: 120. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 1: 150. 1976; Hedge, Orch. Arun. Pradh. 40. 1984; Deva & Naithani, Orch. N.W. Himal. 77. t. 78. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 526. 1998; Bose *et al.* Orch. India. 339. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 63, t. 62. 2002; Lucksom, Orch. Sikkim N.E. Himal. 57-58. t. 66, 2007; Misra, Orch. India. 308. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 14. 2012; *et* Pleione. 7(1): 149 – 150. 2013; Chowdhery & Agrawala, A Century W.H. Orch. 252. 2013; Misra, Orch. Odisha. 170-171. 2014.

Pogonia gammieana Hook. f., Bot. Mag. 109: t.6671. 1883; Bruhl, Guide Orch. Sikkim. 157. 1926.

Plant terrestrial, tuberous herb, 14-20 cm tall. Leaf solitary, 10-14.5 × 9-11 cm, reniform, acuminate, margin wavy, petiolate. Inflorescence 5 to 8-flowered; rachis 5-7 cm long; pedicellate-ovary turbinate. Flowers 2.3-2.9 cm long, whitish-purple, drooping; floral bracts longer than the ovary. Sepals and petals subequal, elliptic-lanceolate, acuminate. Dorsal sepal 2.2-2.5 × 0.5-0.6 cm, elliptic-oblancheolate, acuminate; lateral pair 2.3-2.6 × 0.6-0.9 cm, elliptic-oblancheolate, acuminate. Petals 2-2.3 × 0.6-0.7 cm, elliptic-oblancheolate, acute, whitish purple. Lip 2.2-2.5 × 1.4-1.7 cm, 3-lobed, clavate, clawed; side lobes small, convolute around the column; apical lobe orbicular; disc with two parallel ridges. Column 1-1.1 cm long, semi-terete. Anther dome shaped; pollinia 2.

Flowering	: April – June; Fruiting: May – July.
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Specimen cited : Kumsi forest 850 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0834**, dt. 01. 05. 2009.
 Status : Rare.
 Local distribution : Relli-Pala, Suruk, Godok, Rungdung Valley, 800 – 1100 m.
 General distribution : India (North East India, Sikkim, West Bengal).

Nervilia macroglossa (Hook. f.) Schltr., Bot. Jahrb. Syst. 45: 403. 1911; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Tuyama in Hara, Fl. E. Himal. 1: 445. 1966; Tuyama in Hara, Fl. E. Himal. 2: 191. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 1: 148. 1976; Pradhan, Indian Orch. Guide Identif. Cult. 1: 148. 1976; Banerji, Orch. Nepal. 42. 1982; Hedge, Orch. Arun. Pradh. 40. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 97. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 529-533. 1998; Bose *et al.* Orch. India. 339. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 58. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 30-31. 2005; Lucksom, Orch. Sikkim N.E. Himal. 55. t. 63, pl. 2. 2007; Misra, Orch. India. 308. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et Pleione*. 7(1): 150 – 151. 2013

Pogonia macroglossa Hook. f., Fl. Brit. India 6(1): 120. 1890; Icon. Pl. 23: t.2195. 1894; Bruhl, Guide Orch. Sikkim. 158. 1926.

Nervilia mackinnonii (Duthie) Schltr., Engl. Bot. Jahrb. 45: 402. 1911; Seidenf., 155. fig. 97. 1978; Deva & Naithani, Orch. N.W. Himal. 81. t.80. 1986. [Fig. 4.2]

Plant terrestrial, tuberous herb, 7-16 cm tall. Leaf solitary, 3.8-4.7 × 4-4.55 cm, orbicular-cordate, edges entire, petiolate. Inflorescence solitary flowered; pedicel and ovary short. Flower 2-4 cm long, white tinged with purple; floral bract linear-lanceolate. Sepals and petals subsimilar, linear-lanceolate, acute. Dorsal sepal 2.5-3.3 × 0.2-0.4 cm; lateral pair 2.8-3 × 0.2-0.4 cm, connate at base. Petals 2.5-2.8 × 0.2-0.3 cm, 1-nerved. Lip 2.4-3.5 × 0.5-0.8 cm, obscurely 3-lobed, narrowly oblong in outline; side lobes small, bifid; apical lobe lanceolate, apex subacute, margins slightly undulate. Column 0.5-1.3 cm long, slender, apex clavate. Anther dome shaped; pollinia yellow.

Flowering : May – June; Fruiting: June – August.
 Specimen cited : Samalbong Busty 900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1801**, dt. 22. 05. 2012.
 Status : Sparse.
 Local distribution : Nimbong, Seokbir Khani, Godok, Chamung, Kumsi, Mungpoo, Pedong, 600 – 1800 m.
 General distribution : Nepal, North East India, Bhutan and Myanmar.

Nervilia plicata (Andr.) Schltr., Bot. Jahrb. Syst. 45: 403. 1911. Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 1: 147. 1976; Deva & Naithani, Orch. N.W. Himal. 81 –

83. t. 82. 1986; Bose *et al.* Orch. India. 339. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 60-61. 2002; Lucksom, Orch. Sikkim N.E. Himal. 56. t. 64, pl. 2. 2007; Misra, Orch. India. 308. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 14. 2012; *et* Pleione. 7(1): 151 – 153. 2013; Misra, Orch. Odisha. 164-165. 2014.

Arethusa plicata Andr., Bot. Repos. 5: t.321. 1803.

Cordyla discolor Bl., Bijdr.: 417 1825.

Roprostemon discolor (Bl.) Bl., Fl. Jav. (Praef.): 6. 1828.

Epipactis plicata (Andr.) Roxb., Hort. Bengal.: 63. 1814; Fl. Ind. Ed.1832, 3: 454. 1832.

Pogonia plicata (Roxb.) Lindl., Gen. Sp. Orchid. Pl.: 415. 1840; Bruhl, Guide Orch. Sikkim. 157. 1926.

P. discolor (Bl.) Bl., Mus. Bot. 1: 32. 1849.

P. biflora Wight, Icon. Pl. Ind. Orient. 5(1): t.1758, f.2. 1851.

P. dallachyana f. Mueller *ex* Benth., Fl. Austral. 6: 310. 1873.

P. velutina Par. & Rchb. f., Trans. Linn. Soc. London 30: 142. 1874.

P. pulchella Par., Mason, Burmah: 186. 1883.

P. pulchella Hook. f., Bot. Mag. 111: t.6851 1885.

Nervilia dallachyana (F. Mueller *ex* Benth.) Schltr., Bot. Jahrb. Syst. 39: 48. 1907.

Pogonia pudica Ames, Orchidaceae 2: 44. 1908.

Nervilia velutina (Par. & Rchb. f.) Schltr., Bot. Jahrb. Syst. 45: 403. 1911.

N. biflora (Wight) Schltr., loc. cit. 1911.

N. discolor (Bl.) Schltr., loc. cit. 1911.

Aplostellis velutina (Par. & Rchb. f.) Ridl., Fl. Malay. Penins. 4: 204. 1924.

Plant terrestrial herb, 13-28 cm tall; tuberous. Leaf solitary, 3.5-9 × 3-9.5 cm, orbicular-cordate, acute, edges entire to broadly denticulate, plicate, sometimes blotched with purple, petiolate. Inflorescence erect, 2 to 3-flowered; pedicellate-ovary 0.6-1.2 cm long. Flowers 1.5-1.8 cm long, creamy white to greenish-brown, glabrous; floral bracts ovate-lanceolate. Sepals and petals spreading, oblong-lanceolate, acute, sparsely dotted with tiny glands; dorsal sepal 1.8-2 × 0.3-0.4 cm, elliptic-lanceolate, acute; lateral pair 1.8-2 × 0.3-0.4 cm. Petals 1.2-1.5 × 0.3-0.4 cm. Lip 1.5-2 cm long, white suffused with purple nerves, ecallose; apical lobe ovate-oblong, with a thickened midrib, emarginated. Column 1-1.2 cm long, straight, clavate. Anther pale-green; pollinia yellow.

Flowering : April – June; Fruiting: May – July.

Specimen cited : Kalijhora forest 550 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1598**, dt. 13. 05. 2011.

Status : Sparse.

Local distribution : Nimbong, Teesta river sides, Pareng, Rongo, 300–850m.

General distribution : India (North and North East India, Sikkim, West Bengal); Australia, Malay-Archipelago, Laos, Malaysia, Myanmar, Philippines, South China, Thailand and Vietnam.

Tribe **Vanilleae** Lindl.
Subtribe **Galeolinae** Garay

Galeola Lour.

Plant saprophytic, leafless. Inflorescence racemes or paniculate. Flowers more or less fleshy. Sepals and petals subequal, free, concave. Lip sessile, fleshy, adnate to the base of the column and convolute round it, with or without side lobes, apical lobe large, broad; disc either papillose or with a callus. Column dilated towards the apex. Anther conical, 2-celled; pollinia 2.

The genus *Galeola* Lour., comprises about 20 species distributed in Madagascar, through India, Bhutan, Malaysia, Indonesia and Papua New Guinea to Australia.

Galeola lindleyana (Hook. f. & Thomson) Rchb. f., Xenia Orchid. 2: 78. 1862; Hook. f., Fl. Brit. India 6: 88. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 1: 154. 1976; Chowdhery, Orch. Arunachal Pradesh, 406. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 65-66, 2002; Lucksom, Orch. Sikkim N.E. Himal. 60, t. 70, pl. 41. 2007.

Cyrtosia lindleyana Hook. f. & Thomson, Hook. f., Ill. Himal. Pl.: t.22. 1855.

Erythrorchis lindleyana (Hook. f. & Thomson) Rchb. f., Bonplandia 5: 37. 1857.

Galeola lindleyana var. *unicolor* Handel-Mazzetti, Anz. Akad. Wiss. Wien. Math.-Naturwiss. Kl. 59: 253. 1922.

G. kwangsiensis Handel-Mazzetti, Sinensia 7: 620. 1936.

Plant rhizomatous, saprophytic, erect, more than 5 ft. tall. Stem brownish-purple, sheathed. Inflorescence paniculate, laxly few-flowered; drooping; floral bracts ovate. Flowers 3 - 3.8 cm across, yellow, subglobose; pedicel and ovary hairy. Sepals subequal, with strong toothed, wavy ribbed outer surface; dorsal sepal 1-3 × 1.3-1.5 cm, elliptic-oblong, subacute; lateral pair 3.2 × 2.2 cm, wider, elliptic, acute, wavy ribs externally; petals 1.1-3.6 × 2.4-2.6 cm, broadly ovate, obtuse, margins ciliate, longer than the sepals. Lip 0.9-1.9 cm long, cup-shaped, obscurely 3-lobed; papillose within; disc lamellate, margins ciliate. Column clavate. Anther papillose; pollinia 2.

Flowering : June – August; Fruiting: July – November.

Specimen cited : Rangayrung forest 1760 m. **Rajendra Yonzone, D. Lama and R. B. Bhujel 1747**, dt. 23. 07. 2014.

Status : Threatened.

Local distribution : Dhotrey, Neora Valley. 1500 – 3600 m.

General distribution : North East India, China to South East Asia and Sumatra.

Subfamily **Spiranthoideae** Dressler

Tribe **Cranichideae** Endlicher

Subtribe **Goodyerinae** Klotzsch

Anoectochilus Bl.

Plants terrestrial herbs. Stems succulent, decumbent at the base. Leaves ovate or lanceolate, petiolate, clustered at base in rosette, dark velvet-green with white reticulations, purplish beneath. Inflorescence a laxly flowered raceme. Flowers showy. Sepals and petals free; lateral pair spreading, oblique; petals connivent with dorsal sepal to form a hood over the column. Lip 3-lobed, adnate to column base, spreading; hypochile spurred or saccate, broadly conical to cylindrical, extending beyond the lateral pair; mesochile channeled, lobulate, densely fimbriate to toothed; epichile with divergent, 2-lobed blade; spur with 2 short, broadly peltate glands. Column short, with 2 wing like keels in front. Anther 2-celled; pollinia 2.

The genus *Anoectochilus* Bl., comprises about 25 species distributed in Tropical Asia, Malaysia, Polynesia and adjacent Islands.

Key to the species

1. Flowers upto 2 cm long; lip mesochile
with 4 pairs of short teeth..... *A. brevilabris*
- 1a. Flowers 1.4-2.5 cm long;
lip mesochile 6-7 long teeth *A. grandiflorus*

Anoectochilus brevilabris Lindl., Gen. Sp. Orchid. Pl.: 499. 1840; Hook. f., Fl. Brit. India 6: 95. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan & Pradhan, 100 Beaut. Orch. 31. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 57. 1998; Bose *et al.* Orch. India. 87. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 74-76, 2002; M. Pradhan, 100 Sikkim Himal. Orch. 32-33. 2005; Lucksom, Orch. Sikkim N.E. Himal. 75. t. 84, pl. 3. 2007; Misra, Orch. India. 281. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012 *et* McAllen Int. Orch. Soc. J., 13(4): 8. 2012.

A. griffithii Hook. f., Fl. Brit. India 6(1): 96. 1890; Icon. Pl. 22: t.2159. 1893.

A. sikkimensis King & Pantl., J. Asiat. Soc. Bengal 65(2): 124. 1896; Bruhl, Guide Orch. Sikkim. 172. 1926; Hedge, Orch. Arun. Pradh. 34. 1984.

A. brevilabris var. *gigantea* Pradhan, Indian Orch.: Guide Identify. Cult. 1: 122. 1976.

Plant terrestrial herb, 13-28 cm tall. Stem decumbent. Leaves 4-6, 3.4-6 × 2.3-4 cm, clustered at base of stem, ovate, acute, dark-green with golden nerves, petiolate. Inflorescence densely 8 to 26-flowered; pedicellate-ovary 0.7-1 cm long. Flowers

1.5-2 cm long, whitish-green; floral bracts lanceolate. Dorsal sepal 4.5-6 × 3-4 mm, oblong, obtuse, concave; lateral pair 5-6 × 2.5-3 mm, spreading, oblong, acute. Petals 5-6 × 1.5-2 mm, asymmetric, inner margin straight, outer margin dilated, green with reddish-purple shade at apex. Lip 8-10 × 5-7 mm, white, spurred, claw; mesochile with 4 pairs of short teeth; epichile with 2 terminal, divergent, wedge-shaped lobes; spur pouch-like, bifid. Column 2-3 mm long; rostellum ovate. Anther ovate, cordate; pollinia 2, oblong.

Flowering : June – September; Fruiting: July – October.
 Specimen cited : Lava forest 2210 m. **Rajendra Yonzone, D. Lama and R. B. Bhujel 1275**, dt. 28. 06. 2010.
 Status : Rare.
 Local distribution : Takdah, Rangayrung, Pokhriabong, Chimney, 1000 – 1900 m.
 General distribution : India, (Sikkim, West Bengal).

Anoectochilus grandiflorus Lindl., J. Proc. Linn. Soc., Bot. 1: 179. 1857; Bruhl, Guide Orch. Sikkim. 173. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 124. 1976; Chowdhery, Orch. Fl. Arun. Pradh. 57. 1998; Yonzone *et al.* McAllen Int. Orch. Soc. J., 13(4): 14. 2012.

Odontochilus grandiflorus (Lindl.) Benth. & Hook. f., Fl. Brit. India 6(1): 100. 1890. Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bose *et al.* Orch. India. 356. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 105. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 42-43. 2005; Lucksom, Orch. Sikkim N.E. Himal. 78. t. 88, pl. 3. 2007; Misra, Orch. India. 310. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1546. 2012; *et* Phytotax. 13: 164 – 165. 2013.

Cystopus grandiflorus (Lindl.) Kuntze, Revis. Gen. Pl. 2: 658. 1891.

Plant terrestrial herb, 23-33 cm tall. Stem decumbent, glabrous. Leaves 4-6, 5-10.5 × 2.1-5.3 cm, elliptic, many-nerved, petiolate. Inflorescence laxly many-flowered; peduncle, 6-8 cm long, sparsely hairy; rachis sparsely hairy; pedicellate-ovary 1-1.6 cm long. Flowers 1.4-2.5 cm long, pale-green; floral bracts smaller than ovary. Sepals 0.6-0.8 cm long, unequal, glabrous; dorsal sepal ovate, concave; lateral pair spreading, oblong, falcate, subacute, connate at base. Petals 0.6-0.8 cm long, falcate-oblongate, bluntly acuminate. Lip 1.6-1.9 cm long, 3-lobed, white, with yellow sac at base, claw; mesochile 6-7 long teeth; apical lobe 2-lobed. Column 0.4-0.5 cm long; rostellum bifid. Anther pointed; pollinia 2.

Flowering : June – July; Fruiting: July – August.
 Specimen cited : Damsang forest 1600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1266**, dt. 28. 06. 2010.
 Status : Threatened.
 Local distribution : Algarah forest, Echey Busty, 900 – 1600 m.
 General distribution : Eastern Himalaya.

Cheirostylis Bl.

Plants terrestrial herbs. Stems decumbent, base succulent. Rhizome decumbent. Leaves membranous, petiolate. Inflorescence loosely few-flowered, racemes. Flowers small, resupinate. Sepals slender, united in their lower half into a ventricose tube with the petals. Petals shorter than the sepals. Lip saccate or cymbiform at the base, channeled, 2-callose at base; hypochile sac-shaped with several papillose glands along the lateral nerves; mesochile short, narrow; epichile 2-lobed, rarely subsigmoid and entire. Column short with 2 stylidia at apex; bifid rostellum; stigmas 2; pollinia 2.

The genus *Cheirostylis* Bl., comprises about 25 species distributed from South East Asia, Japan, the Philippines to New Guinea.

Key to the species

1. Decumbent rhizome succulent; stem
not moniliform; 1-2 flowered, stem smooth..... *C. griffithii*
- 1a. Decumbent rhizome not succulent; stem
moniliform; 2-3 flowered, stem hairy..... *C. yunnanensis*

Cheirostylis griffithii Lindl., J. Proc. Linn. Soc., Bot. 1: 188. 1857; Hook. f., Fl. Brit. India 6: 105. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 299, t.397. 1898; Bruhl, Guide Orch. Sikkim. 174. 1926; Tuyama in Hara, Fl. E. Himal. 1: 428. 1966; Tuyama in Hara, Fl. E. Himal. 2: 181. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 1: 113. 1976; Deva & Naithani, Orch. N.W. Himal. 33 – 35, t.32. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 185. 1998; Bose *et al.* Orch. India. 146. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 79. 2002; Lucksom, Orch. Sikkim N.E. Himal. 112-113. t. 123, pl. 5. 2007; Misra, Orch. India. 286. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012.

Cheirostylis macrantha Schltr., Feddes Repert. Spec. Nov. Regni Veg. 2: 83. 1906.

Plant terrestrial herb, 10-24 cm tall. Stem succulent, smooth, decumbent, sheathed. Leaves 5-6, 1.7-2.7 × 1.1-1.6 cm, ovate, withering at anthesis, subacute, petiolate. Inflorescence 1.6-2 cm long, 1 to 2-flowered; pedicellate-ovary hairy. Flowers 1.5-1.7 cm long, white suffused with purple; floral bracts lanceolate. Sepals 1.3-1.6 cm long, connate to the middle into a tube, hairy towards the base, acute, spreading. Petals 1-1.3 cm long, shorter than the sepals, linear-oblong, falcate, acute. Lip 1.4-2 cm long; hypochile boat-shaped; mesochile narrowly clawed; epichile orbicular, fringed with 6 irregular, linear, obtuse teeth on each lobe. Column 2-2.6 mm long. Anther ovate, 2-chambered; pollinia 2.

Flowering : November–December; Fruiting: December – January.

Specimen cited : Munsong 1100 m **Rajendra Yonzone, D. Lama and R. B. Bhujel 1824** dt. 26. 11. 2012.
 Status : Threatened.
 Local distribution : Durpin Hill – Kalimpong, Labdah-Mungpoo, 1000-1400 m.
 General distribution : India (North East India, Sikkim); China, Thailand.

Cheirostylis yunnanensis Rolfe, Bull. Misc. Inform. Kew 1896: 201. 1896; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Pearce & Cribb, Fl. Bhutan, 3(3): 82. 2002; Misra, Orch. India. 286. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et McAllen* Int. Orch. Soc. J., 13(4): 9. 2012.

Cheirostylis pabongensis Lucksom, Indian J. Forest. 20(3): 305. 1997 & Lucksom, Orch. Sikkim N.E. Himal. 113-114. t. 124, pl. 4. 2007.

Plant terrestrial herb, 10-16 cm tall. Pseudobulbs 2.6-3 × 0.8-1.3 cm, moniliform, prostrate. Stem hairy. Leaves 3-5, 1.5-3 × 0.4-1.5 cm, ovate, acuminate, petiolate. Inflorescence 2 to 3-flowered; peduncle and rachis puberulous; pedicellate-ovary hairy. Flowers 1-1.4 cm long, greenish-white; floral bracts acuminate. Sepals 7-9 × 3.5 mm, subsimilar, puberulous, united at base to form a sepaline tube; dorsal sepal 8.5-9 × 3.7-4 mm long, elliptic, acute; lateral pair 6.7-7.3 × 2.3-2.8 mm, elliptic, obtuse. Petals 6.5-7.5 × 1.8-2 mm, obovate-oblong to oblong-spathulate, falcate, obtuse. Lip 1.1-1.4 × 1.2-1.3 cm, white with 2 green spots at the base of apical lobe; hypochile saccate, oblong, glabrous; epichile semi-circular, 2-lobed, margins dentate; callus in sac with 2 rows of 3-5 setae. Column 0.5-0.7 mm long. Anther ovate; pollinia 2, oval.

Flowering : February – April; Fruiting: March – May.
 Specimen cited : Mangaldara 700 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0211**, dt. 09. 03. 2008.
 Status : Rare.
 Local distribution : Kalimpong 8th Mile, Samalbong, Mangaldara, 600 – 1000 m.
 General distribution : India (Sikkim); China, Thailand, Vietnam.

Goodyera R. Br.

Plants terrestrial herbs. Stems erect, leafy. Leaves basal or clustered, several, usually petiolate from inflated sheaths, sometimes reticulately patterned. Inflorescence terminal, erect, few to many-flowered, racemes; peduncle and rachis often hairy. Flowers small, often second and hairy on outer surface. Sepals parallel to the floral axis or with lateral pair spreading; dorsal sepal forming a hood with petals. Lip

unlobed, hollow or saccate at base, hypochile hairy. Column short; rostellum long, deeply cleft; pollinia 2.

The genus *Goodyera* R. Br., comprises about 40 species widely distributed in the Northern temperate zone, South to Mexico and East to Madagascar, South East Asia, the Pacific Islands, New Guinea and Australia.

Key to the species

1. Inflorescence dense, usually much greater than 10 cm long; sepals glabrous on outside; leaves more than 9 cm long..... *G. procera*
- 1a. Inflorescence not dense, usually less than 10 cm long; sepals hairy on outside; leaves less than 9 cm long.....2
2. Leaves ovate-cordate, usually less than 3.5 cm long; flowers white..... *G. biflora*
- 2a. Leaves distant along stem, lanceolate, usually more than 3.5 cm long; flowers white, green or pink.....3
3. Leaves strongly reticulate.....4
- 3a. Leaves not strongly reticulate, green, blotched with white or with a central silver band.....5
4. Flowers subsecund, more than 5 mm across; floral bracts more than 1 cm long.....*G. hemsleyana*
- 4a. Flowers not subsecund, less than 5 mm across; floral bracts less than 1 cm long..... *G. hispida*
5. Petals united at apices; leaves with a median silvery band *G. vittata*
- 5a. Petals free; leaves green or mottled or spots with white6
6. Floral bracts exceeding flowers; leaves ovate-lanceolate *G. foliosa*
- 6a. Floral bracts not exceeding flowers; leaves lanceolate, with white blotching.....*G. schlechtendaliana*

Goodyera foliosa (Lindl.) Benth. ex C.B. Clarke, J. Linn. Soc., Bot. 25: 73. 1889; Hook. f., Fl. Brit. India 6: 113. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 281, t. 374. 1898; Bruhl, Guide Orch. Sikkim. 166. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 108. 1976; Banerji, Orch. Nepal. 37. 1982; Deva & Naithani, Orch. N.W. Himal. 51, t. 50. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 425. 1998; Bose *et al.* Orch. India. 265. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 90. 2002;

Lucksom, Orch. Sikkim N.E. Himal. 97-98. t. 109, pl. 4. 2007; Misra, Orch. India. 301. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et McAllen* Int. Orch. Soc. J., 13(4): 10. 2012; & Pleione. 8(1): 90-91. 2014.

Georchis foliosa Lindl., Gen. Sp. Orchid. Pl.: 496. 1840.

Goodyera secundiflora Griff., Not. Pl. Asiat. 3: 393. 1851; Icon. Pl. Asiat. 3: t.347 f.2. 1851; Tuyama in Hara, Fl. E. Himal. 2: 188. 1971.

Cystorchis nebulorum Hance, J. Bot. 21: 232. 1883.

Goodyera bifida sensu Maximowicz, Mélanges Boil. Bull. Phys. Math. Acad. Imp. Sci. Saint-Petersbourg 12: 926. 1888, *non* Bl.

Orchiodes foliosum (Lindl.) Kuntze, Revis. Gen. Pl. 2: 675. 1891.

O. secundiflorum (Griff.) Kuntze, *loc. cit.* 1891.

Goodyera andersonii King & Pantl., J. Asiat. Soc. Bengal 65(2): 127. 1896.

G. nebulorum (Hance) Rolfe, J. Linn. Soc., Bot. 36: 45. 1903.

Epipactis foliosa (Lindl.) Eaton, Proc. Boil. Soc. Wash. 21: 64. 1908.

Plant terrestrial herb, 28-31 cm tall. Stem 7-15 × 0.4-0.5 cm, decumbent. Leaves 5-8, 2.5-7.8 × 1.3-3.8 cm, ovate-lanceolate, acute, petiolate. Inflorescence densely 7 to 12-flowered; pedicellate-ovary 0.8-1.1 × 0.3 cm long. Flowers 0.9-1.2 cm long, white suffused with reddish-purple, hairy; floral bracts lanceolate, exceeding flowers. Dorsal sepal 0.9-1.3 × 0.4-0.5 cm long, ovate, hooded, acute, dorsally hairy; lateral pair 0.8-1.2 × 0.4-0.5 cm, oblique, ovate, acute, hairy externally. Petals 0.8-0.9 × 0.4-0.5 cm, free, oblique, wedge-shaped to obovate, acute, glabrous, forming a hood with the dorsal sepal over the column. Lip 0.8-1 × 0.4-0.5 cm, simple, ovate; base saccate, papillose; apex obtuse. Column 3.3 × 2.3 mm long. Anther oblong-ovate; pollinia 2, clavate.

Flowering : August – October; Fruiting: September – November.

Specimen cited : Todey forest 1200 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1407**, dt. 08. 08. 2010.

Status : Sparse.

Local distribution : Lava, Neora Valley, 900 – 2600 m.

General distribution : India (North East India, North West India); Bhutan, China, Japan, Myanmar, Nepal, Taiwan and Vietnam.

Goodyera biflora (Lindl.) Hook. f., Fl. Brit. India 6: 114. 1890; Duthie, Ann. Roy. Bot. Gard. (Calcutta) 9: 167, t.127. 1906; Deva & Naithani, Orch. N.W. Himal. 53, f.17. 1986; Bose *et al.* Orch. India. 265. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 95. 2002; Chowdhery & Agrawala, A Century W.H. Orch. 220. 2013.

Georchis biflora Lindl., Gen. Sp. Orchid. 496. 1840.

Epipactis biflora (Lindl.) Eaton, Proc. Boil. Soc. Wash. 21: 63. 1908.

Plant terrestrial herb, 6-11 cm tall. Stem decumbent. Stems erect, stout. Leaves 2, 2.4-3 × 1.6-2.5 cm, ovate-cordate, obtuse, dark bluish-green and reticulated with

white nerved on upper surface, petiolate. Inflorescence 2-7 flowered, terminal racemes with hairy rachis. Flower 2.3-2.5 cm across, second, white, hairy; floral bracts longer than ovary. Sepals 2.3-2.5 × 0.4-0.6 cm, narrowly lanceolate; dorsal sepal recurved at the apex, forming a hood over the column with petals; lateral pair shorter, strongly reflexed, connate at base. Petals 2.3-2.5 × 0.4-0.5 cm, linear-lanceolate, falcate. Lip shorter than sepals and petals, white with yellow tinge, saccate at base. Anther ovate; pollinia 2.

Flowering : July – September; Fruiting: September – November.
 Specimen cited : Gairibas forest 2800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1377**, dt. 31. 07. 2010.
 Status : Rare.
 Local distribution : Neora Valley, Damsang forest, 1900 – 2850 m.
 General distribution : India (Darjeeling, North West India), Nepal.

Goodyera hemsleyana King & Pantl., J. Asiat. Soc. Bengal 64(3): 342. 1896. Hook. f., Bruhl, Guide Orch. Sikkim. 167. 1926; Tuyama in Ohashi, Fl. E. Himal. 3: 146. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 1: 111. 1976; Banerji, Orch. Nepal. 38. 1982; Pradhan & Pradhan, 100 Beaut. Orch. 89. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 427. 1998; Bose *et al.* Orch. India. 267. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 91. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 38-39. 2005; *et* 100 N.E. Indian Orch. 42-43. 2006; Lucksom, Orch. Sikkim N.E. Himal. 96. t. 105, pl. 4. 2007; Misra, Orch. India. 301. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 10. 2012; & Pleione. 8(1): 90-91. 2014.

Plant terrestrial herb, 11-24 cm tall. Leaves 3-5, 2-4.2 × 1-2.5 cm, broadly ovate, acute, dark green with white reticulations. Inflorescence 6-8 cm long, 9 to 14-flowered; peduncle 3.2-4 cm, rachis 2.3-3.5 cm long; pedicellate-ovary 7-8 mm long. Flowers 0.8-1 cm long, white, hairy; floral bracts lanceolate. Sepals subsimilar; dorsal sepal 7.5-8 × 2.5-4 mm, oblong-lanceolate, upper surface long-hairy; lateral pair 8-9.5 × 2.6-3.8 mm, ovate, acuminate. Petals 0.6-0.8 cm long, oblong-lanceolate, falcate. Lip 0.7-0.9 cm long, oblong, entire; base saccate with a sharp tooth at each side of the mouth; apical lobe obtuse, lamellae scabrid. Column 2-3 mm long, beaked. Anther ovate; pollinia 2.

Flowering : July – August; Fruiting: August – September.
 Specimen cited : Senchal 2200 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1388**, dt. 31. 07. 2010.
 Status : Rare.
 Local distribution : Neora Valley, Palmajua, Sukiapokhari, 1800–2600 m.
 General distribution : India (North East India, Sikkim, West Bengal); Bhutan and Nepal.

Goodyera hispida Lindl., Linn. Soc., Bot. 1: 183. 1857; Hook. f., Fl. Brit. India 6: 114. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 282, t. 375. 1898; Bruhl, Guide Orch. Sikkim. 166. 1926; Tuyama in Hara, Fl. E. Himal. 1: 436. 1966; Pradhan, Indian Orch. Guide Identif. Cult. 1: 110. 1976; Pradhan & Pradhan, 100 Beaut. Orch. 90. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 427-431. 1998; Bose *et al.* Orch. India. 267. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 91-92. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 40-41. 2005; Lucksom, Orch. Sikkim N.E. Himal. 96. t. 106, pl. 4. 2007; Misra, Orch. India. 301. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 11. 2012; *et* Pleione. 8(1): 90-91. 2014; Misra, Orch. Odisha. 130-131. 2014.

Orchiodes hispidum (Lindl.) Kuntze, Revis. Gen. Pl. 2: 675. 1891. [Plate 4.22. A]

Plant terrestrial herb, 8-17 cm tall. Leaves 5-7, 2-5 × 1-2 cm, subsessile, elliptic-lanceolate, acuminate, ornamentally reticulated with white on green. Inflorescence erect, spicate, twisted, glandular-hispid, many-flowered; peduncle sheathed; rachis 3.5-5.5 cm long; pedicellate-ovary hairy. Flowers 4-5 mm long, greenish-white, hairy; floral bracts hairy, lanceolate. Sepals subequal, 2.6-4 × 1.7-2 mm, broadly elliptic; dorsal sepal, ovate-oblong, obtuse, concave, recurved at apex, minutely hairy on upper surface. Petals 3-4 × 1.2-1.5 mm, oblong-lanceolate, nearly straight, subacute. Lip 3-3.2 mm long, subglobose saccate, setose within, obtusely beaked, apex recurved. Column short, with linear arms. Anther pyriform; pollinia 2.

Flowering : July – September; Fruiting: August – October.

Specimen cited : Takdah forest 1700 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1421**, dt. 10. 08. 2010.

Status : Rare.

Local distribution : Lava, Kalijhora, Pedong, 350 – 2300 m.

General distribution : India (Sikkim and West Bengal); Bhutan, Java, Philippines, Malaysia, South East Asia, Sri Lanka and Taiwan.

Goodyera procera (Ker-Gawl.) Hook., Exot. Fl. 1(3): t.39. 1823; Hook. f., Fl. Brit. India 6: 111. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 164. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 109. 1976; Banerji, Orch. Nepal. 38. 1982; Deva & Naithani, Orch. N.W. Himal. 55, t. 53. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 431. 1998; Bose *et al.* Orch. India. 269. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 92. 2002; M. Pradhan, 100 N.E. Indian Orch. 40-41. 2006; Lucksom, Orch. Sikkim N.E. Himal. 94. t. 102, pl. 3. 2007; Misra, Orch. India. 301. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 11. 2012; *et* Pleione. 8(1): 90-91. 2014; Chowdhery & Agrawala, A Century W.H. Orch. 222. 2013; Misra, Orch. Odisha. 136-137. 2014.

Neottia procera Ker Gawl., Bot. Reg. 8: t.639. 1822.

Goodyera carnea A. Rich., Ann. Sci. Nat. (Paris) ser.2, 15: 80. 1841.

Cordylestylis foliosa Falconer, J. Bot. (Hooker) 4: 74. 1842.
Leucostachys procera (Ker Gawl.) Hoffmannsegg, Verz. Orch. ed.1: 26. 1842.
Orchiodes procerum (Ker Gawl.) Kuntze, Revis. Gen. Pl. 2: 675. 1891.
Epipactis procera (Ker Gawl.) Eaton, Proc. Boil. Soc. Wash. 21: 65. 1908.
Peramium procerum (Ker Gawl.) Makino, J. Jap. Bot. 6: 36. 1929.

Plant terrestrial herb, 30-58 cm tall; rhizome decumbent. Stem 13-35 cm tall, sheathed. Leaves 6-10, 8-15 × 4-6 cm, ovate-lanceolate, petiolate, acuminate. Inflorescence densely many-flowered; peduncle 7-16 cm long, hairy; rachis 8-20 cm long; pedicellate-ovary twisted. Flowers 3-5 cm across, whitish-green; floral bracts ovate-lanceolate. Sepals similar, ovate-elliptic, acute, glabrous; dorsal sepal 1.5-3 × 1.5-1.7 mm, oblong-ovate, obtuse, concave; lateral pair 2.5-3 × 1.8-2 mm, ovate, obtuse, slightly concave. Petals 2.5-3 × 1-1.4 mm long, spathulate, acute, forming a hood with the dorsal sepal. Lip 1.6-2.1 mm long, subglobose-saccate; disc covered with pellucid glands; apex recurved, 2 white tubercles at the base. Column 1.3-1.5 mm long, fleshy. Anther pyriform; pollinia 2.

Flowering : February – April; Fruiting: March – May.
 Specimen cited : Samalbung Busty 800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0761**, dt. 19. 02. 2009.
 Status : Frequent.
 Local distribution : Pudung, Suruk, Samthar, Panbu, Kumsi, Sittong, 400 – 1100 m.
 General distribution : India (Sikkim, West Bengal); Bhutan, China, Java, Philippines, South East Asia, Sri Lanka, Malaysia and Taiwan.

Goodyera schlechtendaliana Rchb. f., Linnaea 22: 861. 1849; Hook. f., Fl. Brit. India 6: 113. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 283, t. 376. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 434. 1998; Bose *et al.* Orch. India. 269. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 94. 2002; Lucksom, Orch. Sikkim N.E. Himal. 98. t. 110, pl. 4. 2007; Misra, Orch. India. 301. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et* McAllen Inter. Orch. Soc. J., 13(4): 11. 2012; *et* Pleione. 8(1): 90-91. 2014.
Georchis schlechtendaliana (Rchb. f.) Rchb. f., Bonplandia 5: 36. 1854.
Goodyera secundiflora sensu Lindl., J. Proc. Linn. Soc., Bot. 1: 182. 1857; Bruhl, Guide Orch. Sikkim. 165. 1926; Banerji, Orch. Nepal. 38. 1982.
Orchiodes schlechtendaliana (Rchb. f.) Kuntze, Revis. Gen. Pl. 2: 675. 1891.
Epipactis schlechtendaliana (Rchb. f.) Eaton, Proc. Boil. Soc. Wash. 21: 68. 1908.
G. labiata Pampanini, Nuovo Giorn. Bot. Ital. 17: 246. 1910.
G. arisanensi Hayata, Icon. Pl. Formos, 6: 91. 1919.
Epipactis labiata (Pampanini) Hu, Rhodora 27: 106. 1925.
E. secundiflora (Lindl.) Hu, *loc. cit.* 106. 1925.

Plant terrestrial herb, 14-38 cm tall. Stem 6-8 cm tall, sheathed. Leaves 4-8, 2.3-7.5 × 1.1-2.8 cm, lanceolate, acute, petiolate, green with white blotching, reticulate. Inflorescence 12 to 24-flowered, secund, hairy to tomentose; rachis 5-10 cm long; pedicellate-ovary hairy, twisted. Flowers 0.9-1.1 cm long, yellowish-pink, hairy; floral bracts lanceolate. Dorsal sepal 0.9-1.1 × 0.3-0.4 cm, broadly lanceolate, dorsally pubescent; lateral pair 1-1.2 × 0.3-0.4 cm, obliquely ovate, hairy. Petals 0.8-0.9 × 0.3-0.32 cm, white, obovate-lanceolate, appressed to the dorsal sepal. Lip 0.8-1.1 × 0.5-0.7 cm, oblong-ovate; base spatulate, saccate, white tipped with green, disc with 2 lamellae. Column 5-6 mm long, curved. Anther pyriform; pollinia 2.

Flowering : August – September; Fruiting: September – October.
 Specimen cited : Lava forest 2100 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0698**, dt. 07. 09. 2008.
 Status : Sparse.
 Local distribution : Kafer, Takdah, Manaybhanjang, Rimbick, 1500-2300 m.
 General distribution : India, Thailand, China, South East Asia, Japan and Sumatra.

Goodyera vittata (Lindl.) Benth. *ex* Hook. f., Fl. Brit. India 6(1): 113. 1890; Icon. Pl. 22: t.2185. 1894; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 280, t. 372. 1898; Bruhl, Guide Orch. Sikkim. 165. 1926; Tuyama in Hara, Fl. E. Himal. 1: 437. 1966; Tuyama in Hara, Fl. E. Himal. 2: 188. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 1: 108. 1976; Banerji, Orch. Nepal. 41. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 438. 1998; Bose *et al.* Orch. India. 271. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 94-95. 2002; Lucksom, Orch. Sikkim N.E. Himal. 97. t. 107, pl. 4. 2007; Mishra, Orch. India. 301. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 11. 2012; *et* Pleione. 8(1): 90-91. 2014.

Georchis vittata Lindl., J. Proc. Linn. Soc., Bot. 1: 184. 1857.

Orchiodes vittatum (Lindl.) Kuntze, Revis. Gen. Pl. 2: 675. 1891. [Fig. 4.3]

Plant terrestrial herb, 13-18 cm tall. Stem 8-10 cm tall, stout, glabrous, sheathed. Leaves 7-9, 2.4-5 × 1.2-2.3 cm, thick, ovate-lanceolate, acute, upper surface green with a median silvery band, lower surface suffused with purple, petiolate. Inflorescence secund; peduncle bracteate; rachis 4-7.6 cm long; pedicellate-ovary 7-8 mm long, glabrous. Flowers 7-9 mm long, white tinged with pinkish-red; floral bracts lanceolate. Sepals subsimilar 7.5-8.8 × 3.6-4 mm long, oblong-ovate, acute. Petals 7.4-8.9 × 3.4-3.7 mm long, narrowly oblong-ovate, united by their inner margins for half their length. Lip 8.2-9.1 × 3-3.2 mm long, longer than the sepals, 2 lamellae, saccate at base; sac elongate, setose within; apex oblong-lanceolate, subacute. Column stout, white; acute beaked, acuminate. Anther cordate; pollinia 2.

Flowering : July – September; Fruiting: August – October.

Specimen cited	: Todey forest 1500 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0617 , dt. 06. 08. 2008.
Status	: Rare.
Local distribution	: Tangta, Gairibas forest, Jaunbari, Dhotrey 1500 – 3000 m.
General distribution	: India (North East India, Sikkim); Bhutan, China, Nepal.

Herpysma Lindl.

Plant terrestrial annual herb. Stem succulent, decumbent. Leaves ovate-lanceolate, petioled. Inflorescence racemes, subglobose, densely flowered. Flowers crowded in a short sub-sessile raceme. Sepals subequal, puberulous, ovate-oblong, dorsal sepal forming a hood with the oblong petals. Lip spurred, base jointed to the column, deflexed from the middle; apex suborbicular; disc 2-callose. Column short, without appendages; semi-terete. Anther erect, narrow; pollinia 2.

The genus *Herpysma* Lindl., is monotypic genus and widely distributed in South and South East Asia.

Herpysma longicaulis Lindl., Gen. Sp. Orchid. Pl.: 506. 1840; Hook. f., Fl. Brit. India 6: 98. 1890; Bruhl, Guide Orch. Sikkim. 162. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 102. 1976; Banerji, Orch. Nepal. 41. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 456-459. 1998; Bose *et al.* Orch. India. 297. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 95-97, t. 96. 2002; M. Pradhan, 100 N.E. Indian Orch. 44-45. 2006; Lucksom, Orch. Sikkim N.E. Himal. 111-112. t. 122, pl. 4. 2007; Misra, Orch. India. 304. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 12. 2012.

Physurus bracteata Bl., Coll. Orchid.: 97, t.28. 1858.

Erythrodes bracteata (Bl.) Schltr., Schumann & Lauterbach, Nachtrage Fl. Schutzgeb. Sudsee: 89. 1905.

Herpysma sumatrana Carr, J. Malayan Branch Roy. Asiat. Soc. 11(1): 69, t.1b. 1933.
H. bracteata (Bl.) J.J. Sm., Blumea 1: 213. 1934.

Plant terrestrial herb, 27-43 cm tall. Stem 22-32 × 0.5-0.7 cm, decumbent. Leaves 8-11, 4.8-10 × 2-3.5 cm, ovate-lanceolate to elliptic, reticulate, petiolate, base sheathing. Inflorescence densely many-flowered; pedicellate-ovary 0.8-1 cm long, sessile. Flowers 0.9-1.1 cm long, white, hairy; floral bracts oblong-lanceolate. Sepals subsimilar, 0.9-1.2 × 0.3-0.4 cm, broadly lanceolate, subacute, dorsal surface hairy; dorsal sepal boat-shaped. Petals 0.8-0.9 × 0.33-0.4 cm, clavate, elliptic-lanceolate, acute. Lip 0.7-0.85 × 0.4-0.5 cm, oblong, deflexed from the middle; base 2-lobed;

apex subquadrate, apiculate; disc with 2 calluses with a lamella between; spur slender, bifid at apex. Column 2-6 mm long. Anther oblong-ovate, 2-chambered; pollinia 2.

Flowering : September – November; Fruiting: October – December.
Specimen cited : Charkhol forest 1500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0985**, dt. 20. 10. 2009.
Status : Sparse.
Local distribution : Kafer, Rangayrung, 1000 – 2200 m.
General distribution : India (North East India, Sikkim, West Bengal);
Bhutan, China, Myanmar, Nepal, Sumatra,
Thailand and Vietnam.

Odontochilus Bl.

Plants terrestrial herbs. Stem leafy, rhizomes decumbent. Leaves cauline, petiolate, usually green on both surface. Inflorescence a laxly flowered spike or raceme. Flowers often showy. Sepals and petals free; lateral pair spreading, oblique; petals connivent with dorsal sepal to form a hood. Lip 3-lobed, adnate to the column base, spreading; hypochile small, saccate, rounded to globose, enclosed by, or shorter than, lateral pairs; mesochile channeled, shortly fimbriate-toothed; epichile unlobed or with a divergent 2-lobed blade. Column short, fleshy in front, winged or keeled, elongate; rostellum elongate, twisted. Anther versatile; stigmas ventral; pollinia 2.

The genus *Odontochilus* Bl., comprises about 20 species distributed in Tropical Asia, Malaysia, Polynesia and adjacent Islands.

Key to the species

1. Plant upto 20 cm tall..... *O. crispus*
- 1a. Plants more than 20 cm tall2

2. Flowers upto 2 cm long; lip yellow..... *O. lanceolatus*
- 2a. Flowers upto 2.5 cm long; lip white with brown teeth *O. elwesii*

Odontochilus crispus (Lindl.) Hook. f., Fl. Brit. India 6(1): 99. 1890. Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bose *et al.* Orch. India. 356. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 103, t. 104. 2002; Lucksom, Orch. Sikkim N.E. Himal. 76-77. t. 86. 2007; Misra, Orch. India. 310. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 14. 2012.

Anoectochilus crispus Lindl., J. Proc. Soc., Bot. 1: 180. 1857; Bruhl, Guide Orch. Sikkim. 174. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 126. 1976; Banerji, Orch. Nepal. 34. 1982.

Cystopus crispus (Lindl.) Kuntze, Revis. Gen. Pl. 2: 658. 1891.

Plant terrestrial herb, 11-23 cm tall. Stem decumbent. Leaves 3-4, 1.1-3.1 × 0.8-1.9 cm, ovate, acute, petiolate. Inflorescence 3 to 7-flowered; peduncle hairy, sheathed; pedicellate-ovary glabrous. Flowers 1.6-1.8 cm long, greenish-white; floral bracts lanceolate. Sepals subequal, hairy dorsally; dorsal sepal 6-7 × 2-3 mm, convex, apex upturned; lateral pair 7-9 × 4-5 mm long, spreading, oblong, oblique. Petals 5-6 × 2-2.2 mm long, triangular-falcate connivent with dorsal sepal. Lip 1.5-1.9 × 1-1.3 cm, deflexed from the base, white tinged with yellow; hypochile saccate, sac small, globose with 2 large, erose lamellae within; mesochile narrow; epichile suborbicular, margins undulate. Column 2-2.3 mm long. Anther beaked; pollinia 2.

Flowering : August – October; Fruiting: September – November.

Specimen cited : Baggonra forest 1900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1466**, dt. 19. 09. 2010.

Status : Rare.

Local distribution : Latpanjar, Munsong, Mungpoo, 300 – 2800 m.

General distribution : India (Sikkim, West Bengal); China.

Odontochilus elwesii C.B. Clarke *ex* Hook. f., Fl. Brit. India 6(1): 100. 1890; Icon. Pl. t.2167. 1894; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pearce & Cribb, Fl. Bhutan, 3(3): 103. 2002; M. Pradhan, 100 N.E. Indian Orch. 46-47. 2006; Lucksom, Orch. Sikkim N.E. Himal. 78-79. t. 89, pl. 3. 2007; Misra, Orch. India. 310. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 14. 2012.

Cystopus elwesii (C.B. Clarke *ex* Hook. f.) Kuntze, Revis. Gen. Pl. 2: 658. 1891.

Anoectochilus elwesii (C.B. Clarke *ex* Hook. f.) King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 296, t.394. 1898; Bruhl, Guide Orch. Sikkim. 171. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 123. 1976; Chowdhery, Orch. Fl. Arun. Pradh. 57. 1998; Bose *et al.* Orch. India. 87. 1999.

Odontochilus purpureus C.S. Leou, Quart. J. Expt. Forest Nat Taiwan Univ. 6(3): 68. 1992.

Anoectochilus purpureus (C.S. Leon) S.S. Ying. Col. Illust. Orch. Fl. Taiwan 1: 62. 1996.

Plant terrestrial herb, 14-28 cm tall. Stem 7-10 cm long, glabrous, decumbent. Leaves 4-6, 2.5-6.7 × 1.2-3.5 cm, ovate, acute, brown, petiolate. Inflorescence racemes, 4 to 8-flowered; peduncle hairy, sheathed; pedicellate-ovary hairy. Flowers 2-2.5 cm long, greenish-white; floral bracts lanceolate. Sepals subsimilar. Dorsal sepal 0.5-0.7 × 0.4-0.5 cm, ovate-cordate, subacute; lateral pair 0.6-0.7 × 0.4-0.5 cm, broadly oblong, slightly falcate, obtuse, diverging. Petals 0.6-0.8 × 0.4-0.5 cm,

broadly oblong, falcate, acute. Lip 1.6-2 × 1-1.3 cm, 3-lobed, white with brown teeth; hypochile saccate, with 2 calluses; mesochile pectinate; epichile 2-lobed. Column 0.2 cm long, white. Anther beaked; pollinia 2.

Flowering : July – September; Fruiting: August – October.
Specimen cited : Samanden 2500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0695**, dt. 06. 09. 2008.
Status : Rare.
Local distribution : Lava, Sepi, Rimbick, Tangta forest, Gumbadara, 1900 – 2600 m.
General distribution : India (Sikkim and West Bengal).

Odontochilus lanceolatus (Lindl.) Bl., Coll. Orchid.: 80, t.29. 1858; Hook. f., Fl. Brit. India 6: 101. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 295, t. 392. 1898; Tuyama in Ohashi, Fl. E. Himal. 3: 137. 1975; Bose *et al.* Orch. India. 358. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 105-106. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 44-45. 2005; *et* 100 N.E. Indian Orch. 48-49. 2006; Lucksom, Orch. Sikkim N.E. Himal. 77. t. 87, pl. 3. 2007; Misra, Orch. India. 310. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1546. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 14. 2012.

Anoectochilus lanceolatus Lindl., Gen. Sp. Orchid. Pl.: 490. 1840; Bruhl, Guide Orch. Sikkim. 173. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 122. 1976; Chowdhery, Orch. Fl. Arun. Pradh. 61. 1998.

A. luteus Lindl., J. Proc. Linn. Soc., Bot. 1: 179. 1857.

Cystopus lanceolatus (Lindl.) Kuntze, Revis. Gen. Pl. 2: 658. 1891.

Odontochilus yunnanensis Rolfe, J. Linn. Soc., Bot. 36: 43. 1903.

Anoectochilus bisaccatus Hayata, Icon. Pl. Formos. 4: 99, t.15. 1914.

A. densiflorum Mansfeld, Feddes Repert. Spec. Nov. Regni Veg. 27: 294. 1930.

Odontochilus densiflorus (Mansfeld) Tang & Wang *ex* Merrill & Metcalf, Lingnan Sci. J. 21: 12. 1945.

Pristiglottis bisaccatus (Hayata) Nackejima, Boil. Mag. 13: 3. 1975.

Plant terrestrial herb, 16-36 cm tall. Stem 9-18 cm long, glabrous, decumbent. Leaves 5-6, 2.5-5.6 × 1.4-1.8 cm, ovate-lanceolate, acute, petiolate, green with white nerves. Inflorescence laxly many-flowered; peduncle 1-1.2 cm long, hairy; rachis 5-9 cm long, hairy; pedicellate-ovary 0.8-1.1 cm long. Flowers 1.8-2 cm long, light green; floral bracts lanceolate. Dorsal sepal 4.5-6 × 2-2.5 mm, ovate, acute, brownish-green; lateral pair 5.5-7 × 2.5-3.5 mm, ovate-oblong, obtuse, spreading. Petals 3-4.5 × 2-3 mm, reniform, acuminate, connivent with dorsal sepals to form a hood. Lip 0.8-1.2 cm long, 3-lobed, yellow; hypochile saccate with 2 spur-like processes; mesochile pectinate; epichile lobes diverging. Column 1.7-2 mm long, stout. Anther beaked; pollinia 2.

Flowering : August – October; Fruiting: September – November.

Specimen cited	: Ramam forest 2300 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0692 , dt. 06. 09. 2008.
Status	: Rare.
Local distribution	: Lava, Chimney, Sonada, 1800 – 2500 m.
General distribution	: India (Sikkim, West Bengal, Meghalaya); Malaysia, Philippines, Sulawesi, Sumatra.

Rhomboda Lindl.

Plants terrestrial herbs. Stem erect, sheathed. Leaves lanceolate to elliptic-suborbicular, acute, greenish-red, sometimes suffused with bronze. Inflorescence terminal, racemes, few to many-flowered; floral bracts sparsely hairy. Flowers resupinate or non-resupinate, pendent. Sepals ovate-elliptic; lateral pair spreading. Petals forming a hood with dorsal sepal. Lip 3 or 4-lobed; hypochile connate with column margin, with a single rhombic-elliptic basal appendage each side; side lobes truncate, rounded; hypochile large, saccate; mesochile short untoothed or absent; epichile sessile to clawed. Column clavate, winged; rostellum slender; pollinia 2.

The genus *Rhomboda* Lindl., comprises about 22 species distributed in Nepal, North East India, Bhutan, South West China, Myanmar, Thailand, Malaysia, Indonesia, New Guinea, the Solomon Islands and North East Australia.

Rhomboda lanceolata (Lindl.) Ormerod 11(7): 329. 1995. Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pearce & Cribb, Fl. Bhutan, 3(3): 107, t. 108. 2002; Lucksom, Orch. Sikkim N.E. Himal. 91. t. 99, pl. 3. 2007; Misra, Orch. India. 315. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1548. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 17. 2012.

Dossinia lanceolata Lindl., J. Proc. Linn. Soc., Bot. 1: 186. 1857.

Macodes lanceolata (Lindl.) Rchb. f., Xenia Orchid. 1: 226. 1858.

Hetaeria lanceolata (Lindl.) Rchb. f., Trans. Linn. Soc. London 30: 142. 1874.

Zeuxine abbreviata sensu Hook. f., Fl. Brit. India 6(1): 109. 1890; Icon. Pl. 22: t.2178. 1894, non (Lindl.) Hook. f. Bruhl, Guide Orch. Sikkim. 169. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 118. 1976.

Anoectochilus pomrangianus Seidenf., Dansk Bot. Ark. 32(2): 41. 1978.

Odontochilus pomrangianus (Seidenf.) Szlach., Fragm. Florist. Geobot. Suppl. 3: 115. 1995. [Fig. 4.4]

Plant terrestrial herb, 13-36 cm tall. Stem 4-8 cm tall, glabrous. Leaves 3-5, 3.4-6.3 × 1.7-2.3 cm, lanceolate, acute, petiolate, sheathing at base. Inflorescence laxly 9 to 16-flowered; peduncle 5.6-9.1 cm long; rachis 4.7-10 cm long; pedicellate-ovary twisted. Flowers 2.8-3.1 mm long, greenish-white suffused with purple brown; floral

bracts lanceolate. Sepals subsimilar, dorsal sepal 3.8-4.4 × 2.3-2.7 mm, ovate, acute; lateral pair 4.8-5.2 × 2.8-3 mm, ovate. Petals 4-4.6 × 2.3-2.7 mm, obliquely ovate, subacute. Lip 4.5-5 × 2.3 mm, exceeding the sepals, saccate at base; sac with 2 lamellae towards the midrib and a large callus on each side behind the lamellae; apex decurved, 2-lobulate, obliquely ovate. Column 2 × 2 mm, thick. Anther pale white; pollinia 2.

Flowering : August – September; Fruiting: September – October.
 Specimen cited : Damsang forest 1800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1436**, dt. 16. 08. 2010.
 Status : Threatened.
 Local distribution : Kafer, Chimney-Kurseong, Lava, 1100 – 2100 m.
 General distribution : India (Sikkim, West Bengal); Malaysia, Philippines, Sulaw-Esi and Sumatra.

Zeuxine Lindl.

Plants terrestrial herbs; stems glabrous, decumbent. Leaves broad to linear, petiolate, sometimes withered at anthesis. Inflorescence terminal, racemes, laxly to densely few to many-flowered. Flowers resupinate, subcampanulate, often hairy. Sepals subequal; dorsal sepals erect, concave and forming a hood with the petals; lateral pair free. Petals smaller than the sepals, usually hyaline, adnate to the dorsal sepal to form a hood over the column. Lip 3-lobed, adnate to the base of the column; hypochile saccate, enclosing 2-glands; mesochile linear, claw-like; epichile transversely oblong to reniform. Column short; stigmas 2, rostellum bifid at apex. Anther membranous; pollinia 2.

The genus *Zeuxine* Lindl., comprises about 70 species distributed in the tropics and subtropics of the old world with 1 species introduced into North America.

Key to the species

1. Leaves withered at flowering time2
 - 1a. Leaves not withered at flowering time.....3
2. Petals narrowly oblong, blunt *Z. flava*
 - 2a. Petals oblong, acute *Z. reflexa*
3. Epichile of lip entire, not 2-lobed..... *Z. goodyeroides*
 - 3a. Epichile of lip 2-lobed *Z. affinis*

Zeuxine affinis (Lindl.) Benth. *ex* Hook. f., Fl. Brit. India 6(1): 108. 1840; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 169. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Bose *et al.* Orch. India. 466. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 110. 2002; Lucksom, Orch. Sikkim N.E. Himal. 119. t. 133. 2007; Misra, Orch. India. 319. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1549. 2012; *et* Env. Eco. 30(3A): 647. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 19. 2012; Misra, Orch. Odisha. 148-149. 2014.

Etaeria affinis Lindl., Wall. Cat.: 7383. 1832, nom. nud.

Monochilus affine Lindl., Gen. Sp. Orchid. Pl.: 487. 1840.

Aetheria mollis Lindl., J. Linn. Soc., Bot. 1: 184. 1857.

Zeuxine arisanensis Hayata, Icon. Pl. Formos. 4: 106, t.55. 1914.

Adenostylis arisanensis (Hayata) Hayata, Icon. Pl. Formos. Suppl. 6: 75. 1917.

Zeuxine aurantica Schltr., Feddes Repert. Spec. Nov. Regni Veg. 19: 377. 1924.

Z. sutepensis Rolfe *ex* Downie, Bull. Misc. Inform. Kew 1925: 413. 1925.

Plant terrestrial herb, 12-30 cm tall. Stem 8-10 cm tall. Leaves 4-6, 1-3.5 × 0.6-1 cm long, ovate-lanceolate, withered at anthesis, tip obtuse, petiolate. Inflorescence 8-19 cm, laxly 5 to 15-flowered; peduncle 7-12 cm long, sparsely hairy; rachis 3-8 cm long; pedicel and ovary hairy. Flowers 5-7 mm long, whitish-green; floral bracts ovate-lanceolate. Sepals subsimilar, ovate-lanceolate, sub-connivent, dorsal surface sparsely hairy; dorsal sepal 4-5 × 2.4-2.6 mm, broadly ovate, concave, apex acute; lateral pair 3.5-5 × 2.4-2.6 mm, ovate-oblong, apex obtuse. Petals 3-5 mm long, shorter than the sepals, white, elliptic to ovate, oblique. Lip 4.5-5 mm long, yellow to white, hypochile saccate, with 2 stout teeth; epichile with 2 divergent lobules. Column 1.5-2 mm long, wings triangular. Anther lanceolate; pollinia 2.

Flowering	: October – January; Fruiting: November – February.
Specimen cited	: Kafer forest 1800 m, Rajendra Yonzon, D. Lama and R. B. Bhujel 1777 , dt. 23. 12. 2011.
Status	: Threatened.
Local distribution	: Lava, Nockdara, 1600 – 2100 m.
General distribution	: India (North East India, Sikkim, West Bengal); China, Laos, Malaysia, Myanmar, Thailand.

Zeuxine flava (Wall. *ex* Lindl.) Trim., Syst. Cat. Fl. Pl.: 90. 1885; Hook. f., Fl. Brit. India 6: 108. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 170. 1926; Tuyama in Hara, Fl. E. Himal. 1: 452. 1966; Tuyama in Hara, Fl. E. Himal. 2: 195. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 1: 115. 1976; Banerji, Orch. Nepal. 45. 1982; Deva & Naithani, Orch. N.W. Himal. 91. t. 92. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 693. 1998; Bose *et al.* Orch. India. 466. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 111, t. 112. 2002; Lucksom, Orch. Sikkim N.E. Himal. 118. t. 131. 2007; Misra, Orch. India. 319. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1549. 2012; *et* Env. Eco. 30(3A): 647. 2012; *et*

McAllen Int. Orch. Soc. J., 13(4): 19. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 298. 2013.

Etaeria flava Lindl., Wall. Cat.: 7380A/B. 1832.

Monochilus flava Wall. ex Lindl., Gen. Sp. Orchid. Pl.: 487. 1840.

Plant terrestrial herb; 18-29 cm tall. Stem 7-10 cm long, erect, sheathed. Leaves 5-7, 2.5-4 × 1.5-1.8 cm, ovate-lanceolate, glabrous, apex acuminate. Inflorescence 10-14 cm long, laxly 6 to 13-flowered, hairy; peduncle 7-10 cm long; rachis 3-6 cm long; pedicellate-ovary 0.5-0.8 cm long. Flowers 4-5 mm across, yellowish-green to greenish-white, tinged with brown; floral bracts exceeding the ovary. Sepal ovate-oblong, acute, subacute, sparsely hairy; dorsal sepal 2-3 × 2 mm, concave; lateral pair 2-3 × 1.2 mm, ovate, sub acute, slightly concave. Petals 2-3 × 1 mm, narrowly oblong, obtuse, glabrous, white. Lip 3-4 mm long, longer than the sepals, yellow, glabrous; hypochile saccate; epichile 2-lobulate. Column 1.4-2 mm long, stout; apex curving forwards. Anther horizontal; pollinia 2, clavate.

Flowering : March – May; Fruiting: April – June.

Specimen cited : Lava forest 1900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1187**, dt. 26. 05. 2010.

Status : Endangered.

Local distribution : Lopchu, Takdah, 800 – 2100 m.

General distribution : India (Darjeeling, Sikkim); Bhutan, Myanmar, Nepal, Thailand.

Zeuxine goodyeroides Lindl., Gen. Sp. Orchid. Pl.: 486. 1840; Hook. f., Fl. Brit. India 6: 107. 1890; Hedge & Rao, J. Forestry 7(1): 79. 1984; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 170. 1926; Tuyama in Hara, Fl. E. Himal. 2: 195. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 1: 118. 1976; Banerji, Orch. Nepal. 45. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 693-695. 1998; Bose *et al.* Orch. India. 468. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 111 & 113. 2002; Lucksom, Orch. Sikkim N.E. Himal. 116-117. t. 128, pl. 5. 2007; Misra, Orch. India. 319. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1549. 2012; *et* Env. Eco. 30(3A): 647. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 19. 2012.

Monochilus goodyeroides (Lindl.) Lindl., J. Proc. Linn. Soc., Bot. 1: 187. 1857.

Plant terrestrial herb, 13-23 cm tall. Stem 4-8 cm tall, erect, sheathed. Leaves 3-5, 2.5-4.2 × 1.2-2 cm, oblong-ovate, green with white median veins, acute, petiolate. Inflorescence laxly 4 to 16-flowered; peduncle 4-9 cm long, ridged; rachis 2.7-6.5 cm long; pedicellate-ovary 6-8 mm long. Flowers 5-6 mm long, pinkish-white; floral bracts ovate, equaling the ovary. Sepals subsimilar, glabrous; dorsal sepal 3.9-5 × 2.5 mm, ovate, acute; lateral pair 3.7-5 × 1.2-1.6 mm, narrowly oblong-lanceolate. Petals 3.9-5 × 1.5 mm, white, falcate, subacute. Lip 3.8-5 mm long, white, hypochile dilated, saccate, 2-dentate within; mesochile glabrous, margin involute; epichile entire. Column 3 × 3 mm, margins winged below. Anther beaked; pollinia 2, clavate.

Flowering : Augus – September; Fruiting: September – October.
 Specimen cited : Takdah forest 1700 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0690**, dt. 06. 09. 2008.
 Status : Rare
 Local distribution : Neora Valley, Rambi forest, Baggonra, 1400–2300m.
 General distribution : India (North East India, Sikkim); Bhutan, China, Myanmar.

Zeuxine reflexa King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 291, t.388. 1898; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 170. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 116. 1976; Bose *et al.* Orch. India. 470. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 114-115. 2002; Lucksom, Orch. Sikkim N.E. Himal. 119. t. 134, pl. 5. 2007; Misra, Orch. India. 319. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1549. 2012; *et* Env. Eco. 30(3A): 647. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 19. 2012.

Plant terrestrial herb, 16-29 cm tall. Stem 0.5-0.6 cm thick, succulent. Leaves 5-7, 3.5-6.5 × 1.5-2.3 cm, ovate, acute, petiolate, withering at anthesis. Inflorescence 10-20 cm, laxly or subdensely 10 to 22-flowered; peduncle 7-9.5 cm long, lax hairs; rachis 4.5-7.5 cm long; pedicellate-ovary 5-7 mm long. Flowers 0.5-0.6 cm long, white suffused with green; floral bracts hairy. Sepals similar, green; dorsal sepal 3-4.6 × 1.8-2 mm, ovate; lateral pair 3-4.5 × 1.8-2 mm, ovate, slightly oblique, laxly hairy externally. Petals 3.4-4 mm long, white, oblong, acute. Lip 5-6 × 6-8 mm long, yellow, exceeding the sepals, hypochile saccate, 2 calli; mesochile flat; epichile reflexed downward, 2-lobed. Column 1.5-2 mm long, horizontal, with obliquely oblong processes, ventral surface concave. Anther reddish-purple; pollinia 2.

Flowering : April – May; Fruiting: May – June.
 Specimen cited : Damsang forest 1600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1562**, dt. 29. 03. 2011.
 Status : Threatened.
 Local distribution : Mongpu, Algarah, Mungpoo, 1000 – 1600 m.
 General distribution : India (Sikkim); Thailand.

Subtribe *Spiranthinae* Lindl.

Spiranthes Rich.

Plants annual terrestrial herbs, tuberous. Stem short. Leaves conduplicate, fleshy, usually basal. Inflorescence densely flowered, racemes; rachis spirally twisted. Flowers small, subsessile. Sepals free; dorsal sepal erect, connivent with the petals to form a hood; lateral pair oblique, spreading, lip sessile or shortly clawed, entire or lobed, margins undulate, porrect, enveloping the column at base; side lobes parallel with the column. Column short, erect; rostellum bifid. Anther erect, dorsal; pollinia 2.

The genus *Spiranthes* Rich., comprises about 50 species distributed in temperate zones of North America and Eurasia, with a few subtropical species in the old and new worlds.

Spiranthes sinensis (Pers.) Ames, Orch. 2: 53. 1908; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Tuyama in Hara, Fl. E. Himal. 1: 451. 1966; Tuyama in Hara, Fl. E. Himal. 2: 194. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 164. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Banerji, Orch. Nepal. 43. 1982; Deva & Naithani, Orch. N.W. Himal. 87-88. t. 86. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 646. 1998; Bose *et al.* Orch. India. 434. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 116 & 118, t. 117. 2002; Lucksom, Orch. Sikkim N.E. Himal. 136. t. 149, pl. 5. 2007; Misra, Orch. India. 317. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1548. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 19. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 284. 2013; Misra, Orch. Odisha. 152-153. 2014.

Neottia spiralis Willd., Sp. Pl. ed.4(1): 74. 1805.

N. sinensis Pers., Syn. Pl. 2: 511. 1807.

Aristotelea spiralis Lour., Fl. Cochinch. 1(2): 522. 1790.

Neottia flexuosa J.E. Sm., Rees. Cyclip. 24: Neottia 9. 1813.

N. parviflora J.E. Sm., op. cit. 10. 1813.

Spiranthes pudica Lindl., Coll. Bot.: t.30. 1821.

S. longispicata A. Rich., Ann. Sci. Nat. (Paris) ser.2, 15: 78. 1841.

S. densa A. Rich., loc. cit. 1841.

S. indica Steud., Nomencl. Bot. ed.2: 625. 1841.

S. stylites Lindl., J. Linn. Soc., Bot. 1: 178. 1857. [Fig. 4.5]

Plants terrestrial herb, 14-37 cm tall. Stem erect. Leaves 3-5, 6-13 × 0.5-1 cm, in a basal rosette, oblong-lanceolate, acute. Inflorescence densely 12 to 26-flowered spirally arranged; peduncle glandular-hairy, sheathed; rachis spirally twisted; pedicellate-ovary 3-3.9 × 1.5-1.8 mm long. Flowers 5-6 mm long, whitish-purple; floral bracts longer than the ovary. Sepals subsimilar, glandular; dorsal sepal 2.8-4.8

× 1-1.5 mm, oblong-lanceolate, acute; lateral pair 3.1-4.7 × 1.3-1.8 mm, oblong-ovate, obtuse. Petals 2.9-3.8 × 0.8-1 mm, oblong-ovate, obtuse. Lip 3.8-5.5 × 1.7-2 mm, obovate, obtuse, concave; hypochile subsaccate, with 2 large glands, apical margin erose-undulate. Column 1.5-1.8 × 0.8-1.2 mm long, apex bifid. Anther cordate, 2-celled; pollinia 4.

Flowering	: June – September; Fruiting: July – October.
Specimen cited	: Tumbling 2700 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0116 , dt. 19. 09. 2007.
Status	: Sparse.
Local distribution	: Manaybhanjang, Dello Hill, Rachela, Lava, Megma, Chimney, Ramam, Dali-Darjeeling, Takdah, Rimbick, Chitrey, Jalapahar, Tungsong, Dhotrey, 1100 – 2900 m.
General distribution	: India (Sikkim, West Bengal); Australia, East Asia, East Russia, Malay- Archipelago, South West Pacific Island.

Subfamily **Orchidoideae**

Tribe **Orchideae**

Subtribe **Orchidinae**

Gymnadenia R. Br.

Plants terrestrial annual herb; tuber digitately lobed. Stem erect. Leaves linear-lanceolate, conduplicate. Inflorescence terminal, racemes, cylindrical or capitate, densely many-flowered; floral bracts shorter than equaling ovary. Flowers small, resupinate to non-resupinate; pedicellate-ovary cylindrical, sessile, twisted, glabrous. Sepals and petals subequal, free, spreading; dorsal sepal forming hood with petals; lateral pair spreading, decurved. Lip shortly 3-lobed to entire, spurred. Column very short; stigmas 2; rostellum 3-lobed; pollinia 2.

The genus *Gymnadenia* R. Br., comprises about 16 species distributed in Europe, Central and Eastern Asia, China, Japan and the Himalayas.

Gymnadenia orchidis Lindl., Gen. Sp. Orchid. Pl.: 278. 1835; Hook. f., Fl. Brit. India 5: 857. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Deva & Naithani, Orch. N.W. Himal. 117. t. 115-116. 1986; Chowdhery, Orch. Fl. Arun.

Pradh. 440. 1998; Bose *et al.* Orch. India. 271. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 145, t. 144. 2002; Lucksom, Orch. Sikkim N.E. Himal. 140-141. t. 155, pl. 5. 2007; Misra, Orch. India. 301. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et McAllen* Int. Orch. Soc. J., 13(4): 11. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 228. 2013.

Platanthera orchidis Wall. *ex* Lindl., Wall. Cat.: 7039A/B. 1830.

Gymnadenia cylindrostachya Lindl., Gen. Sp. Orchid. Pl.: 278. 1835.

G. violacea Lindl., Gen. Sp. Orchid. Pl.: 278. 1835.

Habenaria orchidis (Lindl.) Hook. f., Fl. Brit. India 6(1): 142. 1890.

H. stoliczkae Kranz., Bot. Jahrb. Syst. 16: 215. 1892-3.

Peristylus orchidis (Lindl.) Kranz., Orchid. Gen. Sp.: 515. 1898.

Orchis habenarioides King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 302, t.401. 1898; Bruhl, Guide Orch. Sikkim. 175. 1926; Banerji, Orch. Nepal. 29. 1982.

O. cylindrostachya (Lindl.) Kranz., Feddes Repert. Spec. Nov. Regni Veg. Beih. 5: 197. 1919.

Gymnadenia delavayi Schltr., Feddes Repert. Spec. Nov. Regni Veg. 16: 282. 1919.

G. himalayica Schltr. *op. cit.* 283. 1919.

G. souliei Schltr. *op. cit.* 284. 1919.

G. conopsea (L.) R. Br. var. *yunnanensis* Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 4: 105. 1919.

G. habenarioides (King & Pantl.) Vermeulen, Jahresber. Naturewiss. Vereins Wuppertal 25: 33. 1972.

Plant terrestrial, tuberous herb, 26-48 cm tall. Stem stout, sheathed. Leaves 4-7, 5-15 × 2-3.6 cm, scattered along the stem, linear-oblong, subacute, sessile. Inflorescence 7-10 cm long, densely many-flowered; peduncle smooth; rachis 6-9 cm long, glabrous; pedicellate-ovary 0.8-1 cm long. Flowers 0.8-1 cm across, pinkish-violet; floral bracts longer than the ovary. Sepals sub-equal; dorsal sepal 3-4.5 × 2-3 mm, elliptic, obtuse; lateral pair 4-5.5 × 2-3 mm, spreading, ovate-lanceolate, obtuse. Petals 3-4.5 × 2.5-3 mm, obliquely ovate-orbicular. Lip 3-3.5 × 2.3-3 mm, 3-lobed, oblong, truncate, adnate to column base, spurred; side lobes rounded; apical lobe circular; spur as long as the ovary. Column 1.5 × 2 mm long. Anther 1-1.2 mm long; pollinia 2.

Flowering : July – September; Fruiting: August – October.

Specimen cited : Sandakphu 3500 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0546**, dt. 08. 07. 2008.

Status : Threatened.

Local distribution : Phalut, 3000 – 4300 m.

General distribution : India (North East India, Sikkim, West Bengal);
Bhutan, China and Nepal.

Habenaria Willd.

Plants terrestrial, tuberous, annual herbs. Stem erect. Leaves many, elliptic to orbicular, base sheathing, uppermost bract-like. Inflorescence terminal, racemes, laxly to densely many-flowered. Flowers white, green or pink. Sepals sub-equal, dorsal sepal forming a hood over column with the petals; lateral pair spreading or reflexed. Petals smaller or larger than the sepals, entire, 2-lobed or bifid. Lip adnate to the base of the column, base spurred, spur usually long, entire or 3-lobed. Column short or long. Anther erect or reclinate; pollinia 2.

The genus *Habenaria* Willd., comprises over 600 species widely distributed across all continents except Antarctica.

Key to the species

1. Petals simple.....2
 - 1a. Petals unequally bifid,*H. stenopetala*

2. Side lobes of lip simple4
 - 2a. Side lobes of lip deeply lacinate to base3

3. Petals hairy or glandular- hairy*H. arietina*
 - 3a. Petals not hairy*H. pectinata*

4. Side lobes of lip filiform, entire *H. furcifera*
 - 4a. Side lobes of lip wedge-shaped,
outer margin denticulate..... *H. dentata*

Habenaria arietina Hook. f., Fl. Brit. India 6(1): 138. 1890; Hook. f., King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 311, t. 407. 1898; Bruhl, Guide Orch. Sikkim. 187. 1926; Tuyama in Hara, Fl. E. Himal. 2: 188. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 147. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 1: 72. 1976; Banerji, Orch. Nepal. 18. 1982; Deva & Naithani, Orch. N.W. Himal. 119 – 123. t. 121. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 91. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 441. 1998; Bose *et al.* Orch. India. 274. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 147-148. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 48-49. 2005; Lucksom, Orch. Sikkim N.E. Himal. 220-221. t. 230, pl. 8. 2007; Misra, Orch. India. 301. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et* Indian Hort. J. 2(3-4): 72. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 11. 2012.

Habenaria pectinata sensu Lindl., Gen. Sp. Orchid. Pl.: 321. 1835.

H. pectinata var. *arietina* (Hook. f.) Kranz., Orchid. Gen. Sp. 1: 405. 1898.

H. intermedia var. *arietina* (Hook. f.) Finet, Rev. Gen. Bot. 13: 530. 1901.

H. pectinata var. *gigantea* Pradhan, Indian Orch.: Guide Identify. Cult. 1: 73. 1976.

H. pectinata var. *khasiana* Pradhan, *loc. cit.* 1976.

Plant terrestrial, tuberous herb, 28-76 cm tall. Stem sheathed. Leaves 7-12, 7-17 × 2.7-5.1 cm, broader, narrowly elliptic, distichous, acute, sessile. Inflorescence with 3 to 9-flowered; rachis 16-22 cm long; pedicellate-ovary hairy. Flowers 3.8-4.2 cm across, green; floral bracts leaf-like. Sepals narrowly oblong-elliptic; dorsal sepal 1.6-1.8 × 0.6-0.7 cm, acute; lateral pair 1.7-1.9 × 0.5-0.7 cm, spreading, oblique, acute. Petals 1.6-1.8 × 0.6-0.7 cm, oblong, oblique, dilated, rounded and gibbous at base, margins glandular- hairy. Lip 2-2.5 cm long, 3-lobed, greenish-white, spurred, clawed; side lobes pectinate-fimbriate; apical lobe shorter than the side lobes; spur longer than the ovary. Column 0.5-0.6 cm tall, broad. Anther locules divergent; pollinia 2.

Flowering	: July – August; Fruiting: August – September.
Specimen cited	: Maneybhanjang 2100 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0621 , dt. 07. 08. 2008.
Status	: Sparse.
Local distribution	: Lava, Megma, Sandakphu, Takdah, Sirikhola, Rimbick, Sandakphu, Palmajua, Ramam, Chitrey, Senchale, Kalpokhari, Tumbling, 1600 – 3600 m.
General distribution	: India (North East and North West India, Sikkim, West Bengal); Bhutan, China and Vietnam.

Habenaria dentata (Sw.) Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 4: 125. 1919; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 309, t. 405. 1898; Tuyama in Ohashi, Fl. E. Himal. 3: 149. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 1: 74. 1976; Banerji, Orch. Nepal. 20. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 444. 1998; Bose *et al.* Orch. India. 276. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 148-149. 2002; Lucksom, Orch. Sikkim N.E. Himal. 219-220. t. 228, pl. 8. 2007; Misra, Orch. India. 302. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et* Indian Hort. J. 2(3-4): 72-73. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 11. 2012.

Orchis dentata Sw., Kongl. Vetensk. Acad. Nya. Handl. Stockh. 21: 207. 1800.

Habenaria geniculata D. Don, Prodr. Fl. Nepal: 25. 1825; Hook. f., Fl. Brit. India 6: 138. 1890; Bruhl, Guide Orch. Sikkim. 184. 1926.

Orchis geniculata Buch.-Ham. *ex* D. Don, *loc. cit.* 1825.

Platanthera geniculata Lindl., Wall. Cat.: 7042. 1832.

P. dentata (Sw.) Lindl., Gen. Sp. Orchid. Pl.: 296. 1835.

Habenaria miersiana Champion, Hooker's J. Bot. Kew Gard. Misc. 7: 37. 1855.

H. sieboldianamiquel Ann. Mus. Bot. Lugduno-Batavi. 2: 208. 1866.

H. geniculata var. *ecalcarata* King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 310, t.405, f.4-5. 1898.

H. miersiana var. *yunnannensis* Finet, J. Bot. (Morot) 12: 341, t.6. 1898.

H. geniculata var. *yunnanensis* (Finet) Finet, Rev. Gen. Bot. 13: 530. 1901.

H. tohoensis Hayata, Icon. Pl. Formos.4: 128. 1914.

H. finetiana Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 4: 126. 1919, based on *H. miersiana* var. *yunnanensis* & *H. geniculata* var. *yunnanensis*.
H. tienensis Tang & Wang, Bull. Fan Mem. Inst. Boil. 7: 136. 1936.
H. dentata var. *ecalcarata* (King & Pantl.) Handel-Mazzetti, Symb. Syn 7: 1336. 1936.
Platanthera dentata f. *ecalcarta* (King & Pantl.) Tuyama, Hara, Fl. E. Himal.: 438. 1966.
H. dentata var. *tohoensis* S.S. Ying, Coll. Illst. Indigo. Orch. Taiwan 1(2): 464. 1977.

Plant terrestrial, tuberous herb, 41-66 cm tall. Stem sheathed at base, leafy in the middle, upper part bracteates. Leaves 4-5, 5.5-10 × 2-3.1 cm, oblong-elliptic, acute, sheathing at base. Inflorescence 9 to 18-flowered; rachis 4-9 cm long, glabrous; pedicellate-ovary twisted. Flowers 1.6-2 cm across, pure white; floral bract as long as the ovary. Dorsal sepal 0.9-1.1 × 0.7-0.8 cm, broadly ovate, acute, erect, margins glandular-hairy; lateral pair 0.9-1.2 × 0.6-0.7 cm, ovate-lanceolate, acute, suberect. Petals 0.7-0.9 × 0.12-0.2 cm, oblong, subacute, reflexed. Lip 1.3-1.6 × 1.3-1.9 cm, 3-lobed, white, spurred, clawed at base, suborbicular outline; side lobes denticulate; apical lobe tongue-shaped; spur longer than the ovary. Column broad, 3-4 mm tall. Anther locules broad, divericcate; pollinia 2.

Flowering : September – October; Fruiting: October – November.
Specimen cited : Algarah forest 1800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0713**, dt. 09. 10. 2008.
Status : Rare.
Local distribution : Soureni-Mirik, Mongpu, Kurseong, Samalbong, 15th Mile-Kalimpong, 600 – 1600 m.
General distribution : India (North East India, West Bengal); Bhutan, Cambodia, China, Japan, Laos, Malaysia, Myanmar, Nepal, Philippines, Taiwan, Thailand, Vietnam.

Habenaria furcifera Lindl., Gen. Sp. Orchid. Pl.: 319. 1835; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 189. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 83. 1976; Deva & Naithani, Orch. N.W. Himal. 131–135. t. 132. 1986; Bose *et al.* Orch. India. 280. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 149. 2002; Lucksom, Orch. Sikkim N.E. Himal. 220. t. 229. 2007; Misra, Orch. India. 302. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et* Indian Hort. J. 2(3-4): 73. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 11. 2012; Misra, Orch. Odisha. 102. 2014.
Habenaria hamigera Griff., Calcutta J. Nat. Hist. 4: 380, t. 234-235. 1844.
H. ovalifolia Wight, Icon. Pl. Ind. Orient. 5: 13, t.1708. 1951.
H. tenuicornis Wall. *ex* Hook. f., Fl. Brit. India 6(1): 149. 1890.

Plant terrestrial, tuberous herb, erect, 41-53 cm tall. Stem glabrous. Leaves 4-6, 7-19 × 3-4.6 cm, clustered in basal, narrowly elliptic, acute, petiolate, sheathing base. Inflorescence laxly 55 to 70-flowered; rachis 13-20 cm long; pedicellate-ovary 1-1.4 cm long. Flowers 0.8-1 cm long, green; floral bracts lanceolate. Sepals unequal; dorsal sepal 3.6-4 × 2-3.5 mm, ovate-oblong, obtuse; lateral pair 4-4.6 × 1.4-1.8 mm, lanceolate, acute, reflexed to spreading. Petals 4-5 × 1.5-2 mm, erect, oblong, obtuse, forming a hood with the dorsal sepal. Lip 7-8 mm, 3-lobed, spurred, shortly clawed; side lobes filiform; apical lobe linear, shorter and broader than the side lobes; spur longer than the ovary. Column 1.4-2.5 mm tall, stout. Anther locules convergent; pollinia 2.

Flowering	: July – September; Fruiting: August – October.
Specimen cited	: Kumsi forest 650 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0656 , dt. 13. 08. 2008.
Status	: Sparse.
Local distribution	: Relli – Pala river sides, Sittong, Pudung-Sendaybong, 600 – 1100 m.
General distribution	: India (Sikkim, West Bengal); China, Myanmar, Nepal and Thailand.

Habenaria pectinata (J.E. Sm.) D. Don, Prodr. Fl. Nepal: 24. 1825; Hook. f., Fl. Brit. India 6: 137. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 310, t. 406. 1898; Bruhl, Guide Orch. Sikkim. 187. 1926; Tuyama in Ohashi, Fl. E. Himal. 3: 153-154. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 1: 72. 1976; Banerji, Orch. Nepal. 22. 1982; Deva & Naithani, Orch. N.W. Himal. 141 – 143. t. 140. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 92. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 448. 1998; Bose *et al.* Orch. India. 286. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 151-152. 2002; Lucksom, Orch. Sikkim N.E. Himal. 221. t. 231, pl. 8. 2007; Misra, Orch. India. 303. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et* Indian Hort. J. 2(3-4): 73. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 11. 2012.

Orchis pectinata J.E. Sm., Exot. Bot. 2: 77, t.99. 1806, *non* Thunberg 1794.

Habenaria gerardiana Lindl., Wall. Cat.: 7031. 1832.

H. ensifolia Lindl. Gen. Sp. Orchid. Pl.: 321. 1835.

H. pectinata subsp. *ensifolia* Soo, Ann. Hist. Nat. Mus. Natl. Hung. 26: 373. 1929.

Plant terrestrial, tuberous herb, 57-76 cm tall. Stem 19-38 cm long, clasping sheathed. Leaves 6-9, 6-16 × 1.8-3.5 cm, distributed in upper part of stem, linear-lanceolate, acuminate, sessile. Inflorescence laxly many-flowered; rachis 8-17 cm long; pedicellate-ovary 2-2.6 cm long. Flowers 2.5-3 cm across, pale green; floral bracts longer than the ovary. Sepals unequal. Dorsal sepal 1.8-2.4 × 0.5-0.7 cm, erect, ovate-lanceolate, acute; lateral pair 1.7-2.4 × 0.6-0.7 cm, spreading, ovate-lanceolate, oblique, acute to acuminate. Petals 1.8-2.5 × 0.3-0.5 cm, narrowly oblong, acute. Lip 2.4-2.6 cm long, greenish-white, 3-lobed, shortly clawed, spurred;

side lobes pectinate, many toothed; apical lobe linear, longer than the side lobes; spur longer than the ovary. Column 3-4 mm long, stout. Anther 2-celled; pollinia 2.

Flowering : July – September; Fruiting: August – October.
Specimen cited : Dhotrang forest 2300 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0647**, dt. 11. 08. 2008.
Status : Rare.
Local distribution : Manaybhanjang, Ramam, Pattabong, Damsang forest, 1500 – 2700 m.
General distribution : Nepal (North East India, North West Himalaya, Sikkim); China, Nepal.

Habenaria stenopetala Lindl., Gen. Sp. Orchid. Pl.: 319. 1835; Hook. f., Fl. Brit. India 6: 134. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 308, t. 404. 1898; Bruhl, Guide Orch. Sikkim. 188. 1926; Tuyama in Ohashi, Fl. E. Himal. 3: 156. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 1: 67. 1976; Banerji, Orch. Nepal. 25. 1982; Deva & Naithani, Orch. N.W. Himal. 147. t. 145. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 452. 1998; Bose *et al.* Orch. India. 289. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 153. 2002; Luckson, Orch. Sikkim N.E. Himal. 222. t. 233. 2007; Misra, Orch. India. 303. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et* Env. Eco. 30(2): 304. 2012; *et* Indian Hort. J. 2(3-4): 73-74. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 11. 2012; Misra, Orch. Odisha. 204-205. 2014.

Habenaria delessertiana Kranz., Annuaire Conserve. Jard. Bot. Geneve 1: 108. 1897.

H. linearipetala Hayata, Icon. Pl. Formos. 4: 126, t.23. 1914.

H. sutepensis Rolfe *ex* Downie, Bull. Misc. Inform. Kew 1925: 420. 1925.

H. amanoana Ohwi, J. Jap. Bot. 31(5): 136. 1956. [Fig. 4.6]

Plant terrestrial, tuberous herb, 43-75 cm tall. Stem 26-32 cm tall, sheathed. Leaves 6-10, 5-16 × 2-3.8 cm, oblong-lanceolate, edges undulate, acute, sessile. Inflorescence densely many-flowered; rachis 5-14 cm long, glabrous; pedicellate-ovary 1.5-2 cm long. Flowers 2-3 cm across, green; floral bracts as long as the ovary. Sepals unequal, oblong-lanceolate. Dorsal sepal 0.9-1.2 × 0.3-0.5 cm; lateral pair 0.9-1.2 × 0.4-0.6 cm, slightly falcate. Petals 0.8-1 × 0.1-0.2 cm, linear-lanceolate, unequally bifid. Lip 2-2.4 × 0.2-0.3 cm long, 3-lobed, spurred, clawed at base; side lobes shorter than the apical lobe, narrowly linear, acute; apical lobe linear; spur as long as the ovary. Column 3-5 mm long. Anther locules convergent; pollinia 2.

Flowering : August – October; Fruiting: September – November.
Specimen cited : Lopchu forest 1500 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1364**, dt. 28. 07. 2010.

Status	: Sparse.
Local distribution	: Lava, Sureil, Algarah, Manaybhanjang, Dabaipani, 300 – 2300 m.
General distribution	: India (North East India, Sikkim); China, Nepal.

Herminium R. Br.

Plants terrestrial, tuberous annual herbs. Leaf solitary or few, cauline or radical, sheathing base. Inflorescence terminal, racemes, laxly to densely many-flowered. Flowers green, small; ovary sessile. Sepals subequal; dorsal sepal free or the dorsal conniving with the petals to form a hood, the lateral pair spreading. Petals usually smaller than the sepals. Lip adnate to the base of the column, as long as or longer than the sepals, fleshy, broad or narrow, entire or 3 or 5-fid, the base concave or very shortly saccate. Column very short. Anther 2-locular; pollinia 2.

The genus *Herminium* R. Br., comprises about 50 species distributed in Europe, across to China, Japan and the Indian subcontinent.

Key to the species

- 1. Lip 5-lobed..... *H. quinquelobum*
- 1a. Lip 3-lobed.....2

- 2. Stem lacking bracts above the leaves..... *H. macrophyllum*
- 2a. Stem with bracts above the leaves.....3

- 3. Lip slightly 3-lobed..... *H. jaffreyanum*
- 3a. Lip distinctly 3-lobed.....4

- 4. Base of lip with short claw; ovary ovoid..... *H. mackinnonii*
- 4a. Base of lip with lip long claw; ovary fusiform..... *H. lanceum*

Herminium jaffreyanum King & Pantl., J. Asiat. Soc. Bengal 65(2): 130. 1896; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 333. 1898; Bruhl, Guide Orch. Sikkim. 193. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 50. 1976; Banerji, Orch. Nepal. 28. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 453. 1998; Bose *et al.* Orch. India. 292. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 161. 2002; Lucksom, Orch. Sikkim N.E. Himal. 174. t. 188, pl. 6. 2007; Misra, Orch. India. 303. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et Biosc. Disc.* 3(2): 238. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 11. 2012.

Plant terrestrial, tuberous herb, 10-14 cm tall. Stem 6-9.5 cm long, sheathed. Leaves

2, 7-12 × 0.4-1 cm, narrowly oblong, acute, sessile, base sheathing. Inflorescence densely many-flowered; rachis 4.5-8 cm long; pedicel and ovary glandular. Flowers 2-3 mm across, green; floral bracts lanceolate, about as long as the ovary. Sepals ovate-elliptic, obtuse; dorsal sepal 1.6-2 × 0.8 mm; lateral pair 1.8-2 × 0.8 mm, spreading. Petals 1.8-2.2 × 0.25 mm, linear-oblong, obtuse. Lip 2-2.2 mm long, oblong-triangular, slightly 3-lobed, spurless; side lobes small, rounded; apical lobe oblong, narrowed at apex. Column 0.6 mm tall, broad. Anther locules parallel; pollinia 2.

Flowering : July – August; Fruiting: August – September.
 Specimen cited : Manaybhanjang 2200 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1682**, dt. 13. 08. 2011.
 Status : Sparse.
 Local distribution : Tonglu, Meghma, Gairibas, Jaunbari, 2200 – 3400 m.
 General distribution : India (North East India).

Herminium lanceum (Thunb. ex Sw.) Vuijk, Blumea 11(1): 228. 1961; Hook. f., Fl. Brit. India 6: 129. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 332, t. 434. 1898; Tuyama in Hara, Fl. E. Himal. 2: 190. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 157. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 1: 50. 1976; Deva & Naithani, Orch. N.W. Himal. 151 – 155. t. 154. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 453-456. 1998; Bose *et al.* Orch. India. 292. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 162-163. 2002; Lucksom, Orch. Sikkim N.E. Himal. 175-176. t. 190, pl. 7. 2007; Misra, Orch. India. 303. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et Biosc. Disc.* 3(2): 238. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 11. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 236. 2013.

Ophrys lancea Thunb. ex Sw., Kongl. Vetensk. Acad. Nya. Handl. 21: 223. 1800.

Satyrium lanceum (Thunb. ex Sw.) Pers., Syn. Pl. 2: 507. 1807.

Aceras angustifolia Lindl., Bot. Reg. 18: *sub t.*1525. 1832.

A. longicruris C. Wright ex A. Gray, Mem. Am. Acad. Arts 6(1): 411. 1858.

A. angustifolia var. *longicruris* (C. Wright ex A. Gray) Miquel, Ann. Mus. Bot. Lugduno-Batavi. 2: 207. 1866.

Platanthera angustifolia (Lindl.) Rchb. f., Otia Bot. Hamburg. 1: 39. 1878.

Herminium angustifolium (Lindl.) Benth. & Hook. f., Gen. Pl. 3: 622. 1880; Bruhl, Guide Orch. Sikkim. 192. 1926; Banerji, Orch. Nepal. 27. 1982.

H. angustifolium var. *longicruris* (C. Wright ex A. Gray) Makino, Bot. Mag. (Tokyo) 10: 109. 1896.

H. altigenum Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 12: 334. 1922.

H. minutiflorum Schltr., Feddes Repert. Spec. Nov. Regni Veg. 19: 373. 1924.

H. stenostachyum Tang & Wang, Bull. Fan Mem. Inst. Boil. 7: 130. 1936.

Monorchis angustifolia (Lindl.) Schwartz, Mitt. Thuring. Bot. Ges. 1: 95. 1941.

Herminium angustifolium var. *brevilabre* Tang & Wang, Acta Phytotax. Sin. 1(1): 61. 1951.

H. longicrure (C. Wright ex A. Gray) Tang & Wang, *loc. cit.* 1951.

H. lanceum var. *longicrure* (C. Wright ex A. Gray) Hara, *J. Jap. Bot.* 44: 60. 1969.

Plant terrestrial, tuberous herb, 26-48 cm tall. Stem erect, sheathed. Leaves 3-4, 9-23 × 0.9-1.8 cm, linear-lanceolate, acuminate, sessile. Inflorescence slender, cylindrical, densely many-flowered; rachis 19-29 cm long, glabrous; pedicellate-ovary 7-9 mm long, fusiform. Flowers 0.8-1 cm long, green; floral bracts lanceolate. Sepals oblong; dorsal sepal 3-4 × 1-1.4 mm, concave, hooded; lateral pair 2.5-3.4 × 1.1-2 mm, spreading. Petals 2.2-2.9 × 0.6-0.7 mm, narrowly linear, subacute. Lip 0.8-1 × 0.1 cm, 3-lobed, oblong, deflexed; base clawed; side lobes filiform, obtuse; apical lobe oblong, obtuse. Column 0.8 mm long. Anther 0.4-0.5 mm long; pollinia 2.

- Flowering : July – September; Fruiting: August – October.
- Specimen cited : Dello Hill 1500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0597**, dt. 01. 08. 2008.
- Status : Sparse.
- Local distribution : Algarah forest, Manibhanjang, Senchale, Rimbick, Dilaram, Ramam, Kalpokhari, Rachel, Lava, Palmajua, 1100 – 2400 m.
- General distribution : India (Kashmir to Arunchal Pradesh); Bhutan, China, Korea, Japan, Java, Malaysia, Myanmar, Nepal, Phillipines, South East Asia, Sulawest and Thailand.

Herminium mackinnonii Duthie, *J. Asiat. Soc. Bengal* 71: 44. 1903; Hook. f., *Fl. Brit. India* 5: 857. 1890; King & Pantl., *Orch. Sikkim Himal.* 89. 1898; Pradhan, *Indian Orch. Guide Identif. Cult.* 1: 50. 1976; Deva & Naithani, *Orch. N.W. Himal.* 155 – 157. t. 156. 1986; Bose *et al.* *Orch. India.* 294. 1999; Pearce & Cribb, *Fl. Bhutan*, 3(3): 163-164. 2002; Lucksom, *Orch. Sikkim N.E. Himal.* 176. t. 191, pl. 7. 2007; Misra, *Orch. India.* 303. 2007; Yonzone *et al.* *Int. J. Pharm. Life Sci.* 3(3): 1543. 2012; *et Biosc. Disc.* 3(2): 238. 2012; *et Nat. J. Life Sci.* 9(2): 219-220. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 11. 2012.

Plant terrestrial, tuberous herb, 13-27 cm tall. Stem sheathed. Leaves 2 or 3, 8-15 × 1-2 cm, linear-lanceolate to oblong, acute, sessile. Inflorescence cylindrical, subdensely many-flowered; rachis 8-14 cm long, glabrous; pedicellate-ovary ovoid, glabrous. Flowers 2-2.5 mm across, green; floral bracts lanceolate. Sepals similar, 2.4-3.5 × 1.4-2 mm, ovate-oblong, acute, spreading. Petals 2.5-3 × 0.3-0.5 mm, linear-lanceolate, acute. Lip 3-4.5 mm long, 3-lobed, clawed, deflexed from base spurless; side lobes filiform, incurved; apical lobe linear-lanceolate, obtuse. Column 3-4 mm tall, stout. Anther locules converging from base; pollinia 2.

- Flowering : July – August; Fruiting: August – September.

Specimen cited : Dello Hill 1450 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0124**, dt. 19. 09. 2007.
 Status : Rare.
 Local distribution : Manaybhanjang, Lava, Durpin-Kalimpong, 1100 – 1600 m.
 General distribution : India (North East India, North West India, Sikkim); Nepal.

Herminium macrophyllum (D. Don) Dandy, J. Bot. 70: 328. 1932; Pradhan, Indian Orch. Guide Identif. Cult. 1: 49. 1976; Deva & Naithani, Orch. N.W. Himal. 157. t. 158. 1986; Bose *et al.* Orch. India. 294. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 164. 2002; Lucksom, Orch. Sikkim N.E. Himal. 174. t. 187. 2007; Misra, Orch. India. 303. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et Biosc. Disc.* 3(2): 238-239. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 11. 2012.

Neottia macrophylla D. Don, Prodr. Fl. Nepal: 27. 1825.

Spiranthes macrophylla (D. Don) Spreng., Syst. Veg. ed.16, 3: 708. 1826.

Herminium congestum Lindl., Bot. Reg. 18: sub t.1499. 1832; Bruhl, Guide Orch. Sikkim. 193. 1926; Banerji, Orch. Nepal. 27. 1982.

Plant terrestrial, tuberous herb, 16-35 cm tall. Stem sheathed. Leaves 2 or 3, 7-12 × 0.4-2 cm, narrowly oblong-elliptic, acute, sessile. Inflorescence densely many-flowered; rachis 3-9 cm long; pedicel and ovary 2.5-3.5 mm long. Flowers 2-3.5 mm across, green, drooping; floral bracts small, ovate-lanceolate. Dorsal sepal 0.8-1.5 × 0.8-1 mm, broadly ovate, obtuse; lateral pair 1.5-2 × 0.5-1 mm, oblong, subacute, spreading. Petals 1-2 × 0.8-1.2 mm, triangular-lanceolate, acute, oblique. Lip 1.8-2.2 × 0.8-1 mm, obscurely 3-lobed, fleshy, ovate-lanceolate, obtuse; side lobes narrow, rounded, margins crenulate; apical lobe entire, surface slightly warty; disc 2-calloses; spur minute. Column 0.6-0.9 mm tall. Pollinia 2.

Flowering : June – August; Fruiting: August – September.
 Specimen cited : Kalpokhari 3200 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1667**, dt. 08. 09. 2009.
 Status : Sparse.
 Local distribution : Bikhaybhanjang, Sandakphu, Phalut, 2750 – 4000 m.
 General distribution : India (North East India); Nepal, China.

Herminium quinquelobum King & Pantl., J. Asiat. Soc. Bengal 65(2): 130. 1896; Bruhl, Guide Orch. Sikkim. 193. 1926; Tuyama in Ohashi, Fl. E. Himal. 3: 157. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 1: 49. 1976; Deva & Naithani, Orch. N.W. Himal. 199 – 200 t. 110. 1986; Bose *et al.* Orch. India. 297. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 167-168. 2002; Lucksom, Orch. Sikkim N.E. Himal. 173-174. t. 186. 2007; Misra, Orch. India. 304. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et Biosc. Disc.* 3(2): 239. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 12. 2012.

Plant terrestrial, tuberous herb, 13-22 cm tall. Stem 5.3 cm long, bracteate. Leaves 2, 8-15 × 0.6-1.3 cm, rising about the middle of the stem, linear-oblong, subacute. Inflorescence subdensely many-flowered; rachis 4.4-10 cm long, glabrous, winged; pedicellate-ovary 2.8-3.4 mm long. Flowers 0.3-0.4 cm across, green; floral bracts lanceolate. Dorsal sepal 2-2.1 × 0.6-0.8 mm, oblong-elliptic, obtuse, erect; lateral pair 1.9-2 × 0.8-0.9 mm, oblong-elliptic, obtuse, spreading. Petals 1.8-2.1 × 0.2-0.3 mm, linear, acuminate, spreading. Lip 2.2-2.6 × 0.6-0.9 mm, 5-lobed, spurless; side lobes triangular, elongate; apical lobe acuminate. Column 0.35-0.4 mm long, broad. Anther locules parallel; pollinia 2.

Flowering : July – August; Fruiting: August – September.
 Specimen cited : Tonglu forest 2900 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1382**, dt. 30. 07. 2010.
 Status : Rare.
 Local distribution : Manaybhanjang, Senchale, Dhotrey, Rambi forest, 1800 – 2600 m.
 General distribution : India (North East India, Sikkim); China, Nepal.

Peristylus Bl.

Plants annual terrestrial herbs; tubers cylindrical to ellipsoid. Stem erect, leaves basal, distant or inserted at middle of stem, sheathed. Leaves few to several, linear to broadly elliptic. Inflorescence terminal, racemes, laxly to densely few to many-flowered. Flowers small, resupinate; pedicellate-ovary porrect, close to rachis. Dorsal sepal and petals forming a hood over column. Petals broad. Lip simple to 3-lobed, connate at base with the margins of the column, ecallose or callose; spur short, pouch-shaped to cylindrical. Column short; stigmas 2; pollinia 2.

The genus *Peristylus* Bl., comprises more than 100 species widely distributed in South East Asia.

Key to the species

1. Lip simple; oblong2
- 1a. Lip 3-lobed.....3
2. Lip resupinate.....*P. nematocaulon*
- 2a. Lip non-resupinate.....*P. superanthus*
3. Lip with a basal callus.....*P. tipuliferus*

- 3a. Lip ecallose.....4
4. Leaf solitary..... *P. fallax*
- 4a. Leaves 2 or more.....5
5. Flowers more than 8 mm across.....6
- 5a. Flowers less than 6 mm across7
6. Flowers yellowish-green, 0.9-1.2 cm across;
dorsal sepal forming hood with petals,
petals not spreading.....*P. goodyeroides*
- 6a. Flowers pure white, 1-2.1 cm across; dorsal sepal
not forming hood with petals, petals spreading.....*P. constrictus*
7. Inflorescence 10-28 cm long; lip base broadly clawed*P. parishii*
- 7a. Inflorescence 6-12 cm long; lip base shortly clawed*P. affinis*

Peristylus affinis (D. Don) Seidenf., Dansk Bot. Arkiv. 31(3): 48, t.23. 1977; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Deva & Naithani, Orch. N.W. Himal. 171. t. 170. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 575 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 174-175. 2002; Luckson, Orch. Sikkim N.E. Himal. 201. t. 216. 2007; Misra, Orch. India. 312. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1546. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 14. 2012; *et* Env. Degrad. Impact Biodiv. 222 – 223. 2013.

Habenaria affinis D. Don, Prodr. Fl. Nepal: 25. 1825; Hook. f., Fl. Brit. India 6: 166. 1890.

Peristylus sampsoni Hance, J. Bot. 6: 37. 1868.

Habenaria sampsoni (Hance) Hance, op. cit. 7: 163. 1869.

H. goodyeroides sensu Hook. f., Fl. Brit. India 6(1): 161. 1890, *non* D. Don, 1825; Bruhl, Guide Orch. Sikkim. 186. 1926.

H. goodyeroides var. *affinis* King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 327, t.430. 1898.

Peristylus goodyeroides var. *affinis* (King & Pantl.) Cooke, Fl. Bombay 2: 712. 1908.

Plant terrestrial, tuberous herb, 14-23 cm tall. Stem 10-15 cm tall, sheathed. Leaves 3 or 4, 3.5-5.5 × 1.5-2.8 cm, clustered, elliptic-oblong, acute. Inflorescence 6-12 cm long, many-flowered; rachis 4-9 cm long; pedicellate-ovary twisted. Flowers 4-6 mm across, white tinged with green; floral bracts lanceolate. Sepals unequal; dorsal sepal 3-3.7 × 1.6-2 mm, ovate-lanceolate, concave, forming hood with petals; lateral pair 3-3.7 × 1.6-2 mm, oblong, apiculate. Petals 2.7-3 × 1.6-2 mm, gibbously ovate. Lip 2-2.8 × 2-2.4 mm, oblong, 3-lobed, spurred, base clawed; hypochile saccate, side lobes oblong, obtuse; apical lobe oblong, obtuse; spur saccate. Column 0.9-1.1 mm tall. Pollinia 2.

Flowering : June – August; Fruiting: July – September.
 Specimen Cited : Panbu Busty 850 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0630**, dt. 07. 08. 2008.
 Status : Rare.
 Local distribution : Algarah, Seokbir khani, 600 – 1900 m.
 General distribution : India (North East India, North West India, Sikkim); China, Laos, Myanmar, Nepal and Thailand.

Peristylus constrictus (Lindl.) Lindl., Gen. Sp. Orchid. Pl.: 300. 1835; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 1: 96. 1976; Deva & Naithani, Orch. N.W. Himal. 173. t. 172. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 104. 1997; Bose *et al.* Orch. India. 379. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 175. 2002; Lucksom, Orch. Sikkim N.E. Himal. 198. t. 210, pl. 8. 2007; Misra, Orch. India. 312. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1546. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 15. 2012; *et* Env. Degrad. Impact Biodiv. 222 – 223. 2013; Misra, Orch. Odisha. 196-197. 2014.

Herminium constrictum (Lindl.) Hook. f., Fl. Brit. India 6(1): 161. 1890.

H. cylindrocalyx Gagnep., Bull. Soc. Bot. France 78: 68. 1931.

Plant terrestrial, tuberous herb, 36-72 cm tall. Stem 26-61 cm long, bearing leaves in lower half. Leaves 5-6, 6-16.5 × 3.5-7.5 cm, ovate-lanceolate, acute, petiolate, sheathing at base. Inflorescence subdensely many-flowered; peduncle 8-13 cm long; rachis 10-24 cm long; pedicellate-ovary twisted. Flowers 1.4-2.1 cm long, white, fragrant; floral bracts lanceolate. Dorsal sepal 0.9-1 × 0.2-0.3 cm, oblong-lanceolate, obtuse; lateral pair 0.9-1 × 0.2-0.3 cm, oblong-lanceolate, subacute. Petals 0.9-1.1 × 0.4-0.5 cm, ovate to lanceolate, subacute, spreading. Lip 1.1-1.3 cm long, white, 3-lobed, spurred; base clawed; side lobes linear, falcate, diverging; apical lobe oblong, obtuse; spur globose, compressed. Column 1-1.5 mm tall, broad. Anther locules close; pollinia, oblong-ovoid.

Flowering : June – August; Fruiting: July – September.
 Specimen cited : Relli river sides near Neol forest 600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1251**, dt. 20. 06. 2010.
 Status : Sparse.
 Local distribution : Kumsi, Mangmaya, Latpanjar, Birik, Nimbong, Ambeok, 300 – 1600 m.
 General distribution : India (Sikkim and West Bengal); Cambodia, China, Myanmar, Nepal, Thailand and Vietnam.

Peristylus fallax Lindl., Gen. Sp. Orchid. Pl.: 298. 1835; Pradhan, Indian Orch. Guide Identif. Cult. 1: 93. 1976; Deva & Naithani, Orch. N.W. Himal. 181. t. 180-182. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 575. 1998; Bose *et al.* Orch. India. 381. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 176 & 178. 2002; Lucksom, Orch. Sikkim N.E. Himal. 199. t. 212. 2007; Misra, Orch. India. 312. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1546. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 15. 2012; *et* Env. Degrad. Impact Biodiv. 222 – 223. 2013.

Herminium fallax Lindl., Wall. Cat.: 7412. 1832.

H. fallax (Lindl.) Hook. f., Fl. Brit. India 6(1): 129. 1890; Icon. Pl. 22, ser.4(2): t.2198. 1894.

Habenaria fallax (Lindl.) King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 325, t.428. 1898; Bruhl, Guide Orch. Sikkim. 183. 1926.

Platanthera fallax (Lindl.) Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 4: 111. 1919.

Plant terrestrial, tuberous herb, 21-35 cm tall. Stem glabrous, sheathed. Leaf solitary, 5-14 × 1-2 cm, linear-lanceolate, acute. Inflorescence laxly few to many-flowered; rachis 3.6-12 cm long; pedicellate-ovary decurved. Flowers 3-3.4 mm across, green; floral bracts longer or equaling the ovary. Sepals subequal; dorsal sepal 2.9-3.2 × 1.5-2 mm, oblong to ovate-lanceolate, obtuse, forming hood with petals; lateral pair spreading. Petals 2.7-3 × 0.7-1.2 mm, oblong, obtuse. Lip 2.8-3.6 × 1.4-2.3 mm, 3-lobed, spurred, clawed; side lobes divergent, oblong, obtuse; apical lobe longer and deflexed; spur slightly 2-lobed at apex. Column 0.7-0.9 mm tall. Anther locules parallel; pollinia 2.

Flowering : June – August; Fruiting: July – September.

Specimen cited : Kalpokhari 3300 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1401**, dt. 05. 08. 2010.

Status : Threatened.

Local distribution : Bikhaybhanjang, Sandakphu forest, Jaunbari, 2200 – 3800 m.

General distribution : India (North West and North East India, Sikkim); Bhutan, China and Nepal.

Peristylus goodyeroides (D. Don) Lindl., Gen. Sp. Orchid. Pl.: 299. 1835; Pradhan, Indian Orch. Guide Identif. Cult. 1: 96. 1976; Deva & Naithani, Orch. N.W. Himal. 181 – 183. t. 184. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 575. 1998; Bose *et al.* Orch. India. 381. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 178. 2002; Lucksom, Orch. Sikkim N.E. Himal. 197-198. t. 209, pl. 7. 2007; Misra, Orch. India. 312. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1546. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 15. 2012; *et* Env. Degrad. Impact Biodiv. 222 – 223. 2013; Misra, Orch. Odisha. 198-199. 2014.

Habenaria goodyeroides D. Don, Prodr. Fl. Nepal: 25. 1825; Hook. f., Fl. Brit. India 6: 161. 1890; Bruhl, Guide Orch. Sikkim. 186. 1926; Tuyama in Ohashi, Fl. E. Himal. 3: 150-152. 1975.

Herminium goodyeroides (D. Don) Lindl., Wall. Cat.: 7066. 1832, *nom. nud.*; Bot. Reg. 18: sub t.1499. 1832.

Platanthera goodyeroides (D. Don) Vidal, Phan. Cuming. Philipp.: 15. 1885.

Peristylus sphaerocephalon Tang & Wang, Acta Phytotax. Sin. 1:64. 1951. [Plate 4.22. B]

Plant terrestrial, tuberous herb, 36-56 cm tall. Stem sheathed at base. Leaves 3 or 4, 6-15 × 4-6.3 cm, clustered at the middle of the stem, ovate-elliptic, acute, with sheathing base. Inflorescence densely many flowered; rachis 9-20 cm long; pedicellate-ovary twisted. Flowers 0.9-1.2 cm across, fragrant, yellowish-green; floral bracts equaling or exceeding the ovary. Sepals unequal; dorsal sepal 5-5.4 × 1.8-2.6 mm, ovate-lanceolate, forming hood with petals; lateral pair 4.5-6 × 1-1.5 mm, oblong, apiculate. Petals 3.6-4.1 × 3.5-4.3 mm, rhombic, obtuse. Lip 4.5-5.5 × 3.5-4.5 mm, 3-lobed, spurred, triangular; side lobes linear-oblong, diverging; apical lobe broader; spur subglobose. Column 2-2.5 mm tall. Anther locules parallel; pollinia 2.

Flowering : June – July; Fruiting: July – August.

Specimen cited : Samthar Busty 1000 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0496**, dt. 21. 06. 2008.

Status : Sparse.

Local distribution : Samalbong, Kumsi, Mangmaya, Suruk, 400–1500 m.

General distribution : India, (North West India, Sikkim and West Bengal), Bhutan, China, Indonesia, Malaysia, New Guinea, Philippines and South East Asia.

Peristylus nematocaulon (Hook. f.) M.L. Banerji & P. Pradhan, Orchid. Nepal Himalaya: 106. 1984; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pearce & Cribb, Fl. Bhutan, 3(3): 179-180. 2002; Lucksom, Orch. Sikkim N.E. Himal. 195-196. t. 205, pl. 7. 2007; Misra, Orch. India. 312. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1546. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 15. 2012; *et* Env. Degrad. Impact Biodiv. 222 – 223. 2013.

Habenaria nematocaulon Hook. f., Fl. Brit. India 6(1): 154. 1890; Bruhl, Guide Orch. Sikkim. 178. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 86. 1976; Bose *et al.* Orch. India. 284. 1999.

H. juncea King & Pantl., J. Asiat. Soc. Bengal 65(2): 132. 1897.

Platanthera juncea (King & Pantl.) Kranz., Orchid. Gen. Sp.: 1: 942. 1901.

P. nematocaulon (Hook. f.) Kranz., *loc. cit.* 1901.

Plant terrestrial, tuberous herb, 16-29 cm tall. Stem erect, slender. Leaf solitary, 2-5 × 0.7-1.7 cm, oblong-elliptic, subacute, sessile, sheathing at base. Inflorescence laxly

5 to 10-flowered; rachis 4.5-8 cm long; pedicellate-ovary glabrous. Flowers 2-2.8 mm across, white to pale green; floral bracts lanceolate. Dorsal sepal 1.6-2.3 × 1-1.5 mm, ovate-lanceolate, acute, erect; lateral pair 1.5-2.4 × 0.8-1 mm. Petals 1.7-2.5 × 0.8-1.5 mm, ovate-triangular, acute. Lip 1.5-2.2 × 0.8-1 mm, simple, spurred, oblong-lanceolate, obtuse; spur clavate. Column 0.6-0.8 mm tall. Anther locules parallel; pollinia elliptic.

Flowering : June – August; Fruiting: July – September.
 Specimen cited : Lamaydhura 2600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0626**, dt. 07. 08. 2008.
 Status : Rare.
 Local distribution : Tonglu, Megma, Ramam, Sandakphu, 2400–3600 m.
 General distribution : India (North East India, Sikkim); Bhutan, China and Nepal.

Peristylus parishii Rchb. f., Trans. Linn. Soc. London 30: 139. 1874; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 1: 97. 1976; Bose *et al.* Orch. India. 383. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 180. 2002; Lucksom, Orch. Sikkim N.E. Himal. 200. t. 214. 2007; Misra, Orch. India. 312. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1546. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 15. 2012; *et* Env. Degrad. Impact Biodiv. 222 – 223. 2013; Misra, Orch. Odisha. 202-203. 2014.

Habenaria parishii (Rchb. f.) Hook. f., Fl. Brit. India 6(1): 161. 1890; Bruhl, Guide Orch. Sikkim. 185. 1926.

Plant terrestrial, tuberous herb, 33-51 cm tall. Stem bracteates. Leaves 4 or 5, 7-11 × 3.2-5.6 cm, ovate-elliptic, acute, petiolate, sheathing base. Inflorescence laxly many-flowered; rachis 13-26 cm long; pedicellate-ovary 0.7-1 cm long. Flowers 0.4-0.7 cm across, olive-green; floral bracts lanceolate. Dorsal sepal 3.7-3.9 × 1.3-1.7 mm, oblong-lanceolate, obtuse; lateral pair 3-3.5 × 0.6-0.8 mm, narrowly oblong, obtuse, spreading. Petals 2.5-3.5 × 1.5-2 mm, broadly ovate, subacute. Lip 3-3.7 mm, 3-lobed, spurred, sigmoid; base clawed; side lobes oblong; apical lobe oblong, exceeding the side lobes; spur fusiform. Column 0.8-1.1 mm long. Anther locules parallel; pollinia pyriform.

Flowering : June – July; Fruiting: July – August.
 Specimen cited : Samalbong Busty 700 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1231**, dt. 15. 06. 2010.
 Status : Rare.
 Local distribution : Yangmakum, Pareng, Gasoke, Sittong, 500 – 800 m.
 General distribution : India (Sikkim, West Bengal); Andaman Island, China, Myanmar, Nepal, Thailand, Vietnam.

Peristylus superanthus J.J. Wood, Kew Bull. 41(4): 811. 1986; Hook. f., Fl. Brit. India 5: 857. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Pearce & Cribb, Fl. Bhutan, 3(3): 181-182. 2002; Lucksom, Orch. Sikkim N.E. Himal. 196. t. 206. 2007; Misra, Orch. India. 312. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1546. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 15. 2012; *et* Env. Degrad. Impact Biodiv. 222 – 223. 2013.

Habenaria nematocaulon sensu King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 316, t.416. 1898; Bruhl, Guide Orch. Sikkim. 178. 1926.

Plant terrestrial, tuberous herb, 9-23 cm tall. Stem slender, sheathed. Leaf solitary, 2.2-3.8 × 1.5-2 cm, narrowly oblong-elliptic to ovate, obtuse, sessile, sheathing at base. Inflorescence cylindric, densely few to many-flowered; rachis 1.5-3 cm long; pedicellate-ovary twisted. Flowers 3.5-4 mm across, white suffused with pink; floral bracts ovate-elliptic. Dorsal sepal 2.5-4 × 0.8-1 mm, oblong-lanceolate, obtuse; lateral pair similar, connivent. Petals 2.4-4 × 1.5-2 mm, ovate, slightly falcate, shortly caudate to obtuse, fleshy. Lip 3-4 × 0.6-0.8 mm, simple, entire, spurred, oblong, apex fleshy, obtuse; spur slightly curved. Column 0.8-1 mm long. Anther broad; pollinia 2.

Flowering : July – August; Fruiting: August – September.
Specimen cited : Megma 2700 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1372**, dt. 30. 07. 2010.
Status : Sparse.
Local distribution : Tonglu, Gairibas forest, 2500 – 3300 m.
General distribution : India (Sikkim West Bengal); Nepal.

Peristylus tipuliferus (Par. & Rchb. f.) Mukerjee, Notes Roy. Bot. Gard. Edinburgh 21: 158. 1953; Hook. f., Fl. Brit. India 5: 857. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Bose *et al.* Orch. India. 385. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 182. 2002; Lucksom, Orch. Sikkim N.E. Himal. 196-197. t. 207, pl. 7. 2007; Misra, Orch. India. 312. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1546. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 15. 2012; *et* Env. Degrad. Impact Biodiv. 222 – 223. 2013.

Habenaria tipulifera Par. & Rchb. f., Trans. Linn. Soc. London 30: 139. 1874.

H. brandisii Hook. f., Fl. Brit. India 6(1): 162. 1890.

H. aristata sensu King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 312. 1898, non (Lindl.) Hook. f.

Peristylus brandisii (Hook. f.) Kranz., Orchid. Gen. Sp.: 506. 1901. [Fig. 4.7]

Plant terrestrial, tuberous herb, 28-56 cm tall. Stem erect. Leaves 3-5, 4-12 × 2.2-2.7 cm, linear-oblong, acuminate, subsessile, base sheathing. Inflorescence laxly 23 to 30-flowered; rachis 22-38 cm long; pedicellate-ovary 0.7-1.1 cm long. Flowers 3.5-4.3 mm across, green or greenish-yellow; floral bracts linear-lanceolate. Dorsal sepal 3.8-4.7 × 1.4-1.9 mm, ovate, obtuse, erect; lateral pair 3.7-4.6 × 1.4-2 mm, wedge-

shaped or oblong, obtuse. Petals 3.8-4.2 × 1.8-2.2 mm, erect, oblong, falcate, obtuse. Lip spurred, shortly clawed; side lobes divaricate, elongate-filiform; apical lobe lanceolate, porrect; spur curved. Column 1-1.6 mm tall. Anther locules small, parallel; pollinia obovoid.

Flowering	: June – August; Fruiting: July – September.
Specimen cited	: Dello Hill-Kalimpong 1500 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0582 , dt. 01. 08. 2008.
Status	: Sparse.
Local distribution	: Neora Valley, Megma, Tonglu, Dowhill-Kurseong, 1000 – 2800 m.
General distribution	: India (North East India Sikkim, West Bengal); Myanmar and Nepal.

Platanthera Rich.

Plants annual, tuberous terrestrial herbs; tuber entire, fusiform or ovoid. Stem erect, sheathed. Leaves basal or cauline. Inflorescence terminal, racemes, laxly to densely flowered; floral bracts leaf like. Flowers small to medium-sized; pedicellate-ovary cylindrical to fusiform. Dorsal sepal and petals usually connivent to form a hood; lateral pair free, spreading or recurved. Lip entire or lobed, 1 spur; spur variable, filiform, cylindrical or clavate. Column short, truncate; stigma 1-lobe. Anther locules separated; pollinia 2.

The genus *Platanthera* Rich., comprises about 100 species distributed widely in the temperate regions of Northern and Southern hemispheres.

Key to the species

1. Plant with solitary leaf (rarely 2)2
 - 1a. Plant with more than 2 leaves3
2. Peduncle with solitary or 2 leafy bracts *P. exellinia*
 - 2a. Peduncle with more than 2 leafy bracts *P. leptocaulon*
3. Spur less than 3 mm long; lip base with small but distinct side lobes *P. biermanniana*
 - 3a. Spur more than 6 mm long; lip entire4
4. Sepals not ciliate.....5

- 4a. Sepals ciliate6
5. Caudicles absent; stigma inserted
below the spur opening *P. bakeriana*
- 5a. Caudicles long; stigma inserted
above the spur opening *P. stenantha*
6. Leaf margin undulate *P. cumminsiana*
- 6a. Leaf margin not undulate7
7. Spur less than 0.6 cm long *P. clavigera*
- 7a. Spur more than 1 cm long *P. edgeworthii*

Platanthera bakeriana (King & Pantl.) Kranz., Orchid. Gen. Sp. 1: 632. 1898; Tuyama in Hara, Fl. E. Himal. 1: 488. 1966; Tuyama in Hara, Fl. E. Himal. 2: 189. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 1: 58. 1976; Banerji, Orch. Nepal. 31. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 602. 1998; Bose *et al.* Orch. India. 399. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 185. 2002; Lucksom, Orch. Sikkim N.E. Himal. 144-145. t. 160. 2007; Misra, Orch. India. 313. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1547. 2012; *et J. Interacad.* 16(4): 833. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 16. 2012.

Habenaria bakeriana King & Pantl., J. Asiat. Soc. Bengal 65(2): 132. 1896 & Ann. Roy. Bot. Gard. Calcutta 8: 314, t. 413. 1898; Bruhl, Guide Orch. Sikkim. 182. 1926.

Plant terrestrial, tuberous herb, 27-39 cm tall. Stem glabrous, sheathed. Leaves 3-5, distant along stem, sessile; lower leaves 4.7-13 × 1.3-4.2 cm, oblong, subacute, base sheathing; upper leaves gradually decreasing in size. Inflorescence 16-20 cm, laxly many-flowered; rachis 8-13 cm long; pedicellate-ovary 0.6-0.8 mm long. Flowers 0.8-1 cm across, green to greenish-yellow; floral bracts much longer than the ovary. Sepals not ciliate; dorsal sepal 4-5 × 1-2.7 mm, ovate-elliptic, forming a hood with petals over the column; lateral pair 4-6 × 1-2.3 mm, oblong-obtuse, reflexed. Petals 3-3.5 × 1.5-2.3 mm, broadly ovate, oblique. Lip 4-6 × 1.6-1.9 mm, entire, spurred, oblong, base broadened; spur cylindrical, twice as long as the ovary. Column short, stout; pollinia 2.

Flowering	: June – August; Fruiting: July – September.
Specimen cited	: Tumbling 2800 m, Rajendra Yonzon, D. Lama and R. B. Bhujel 1367 , dt. 30. 07. 2010.
Status	: Rare.
Local distribution	: Megma, Tonglu, Phalut forest, Bikhaybhanjang, Gairibas, Neora Valley, 2200 – 3400 m.
General distribution	: India (Eastern Himalaya, Sikkim); Bhutan, China.

Platanthera biermanniana (King & Pantl.) Kranz., Orchid. Gen. Sp. 1: 636. 1898; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pearce & Cribb, Fl. Bhutan, 3(3): 186. 2002; Lucksom, Orch. Sikkim N.E. Himal. 144. t. 159. 2007; Misra, Orch. India. 314. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1547. 2012; *et J. Interacad.* 16(4): 833. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 16. 2012.

Habenaria biermanniana King & Pantl., J. Asiat. Soc. Bengal 64(3): 343. 1896; Bruhl, Guide Orch. Sikkim. 178. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 86. 1976; Bose *et al.* Orch. India. 274. 1999.

Plant terrestrial, tuberous herb, 16-34 cm tall. Stem slender, sheathed. Leaves 3-6, 2.5-7.5 × 1.4-2.1 cm, distant, lanceolate, acute, clasping. Inflorescence laxly 7 to 13-flowered; rachis 5.5-14 cm long; pedicellate-ovary glabrous. Flowers 3.5-4.5 mm across, green; floral bracts linear-lanceolate. Sepals, ovate-lanceolate, subacute, base oblique, forming hood with the petals; dorsal sepal 4.5-6 × 1.5-2 mm; lateral pair 4-5 × 0.8-1.5 mm. Petals 3.8-4.5 × 1.5-2 mm, triangular-lanceolate, subacute. Lip 3.5-4.5 mm long, obscurely 3-lobed, spurred; side lobes obtuse; apical lobe linear-oblong, apex obtuse, decurved; spur less than 3 mm long. Column 0.9-1 mm long; pollinia 2.

Flowering : July – August; Fruiting: August – September.
Specimen cited : Tonglu 2900 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1369**, dt. 30. 07. 2010.
Status : Sparse.
Local distribution : Chetrey, Megma, Kalpokhari, Neora Valley, 2200 – 3200 m.
General distribution : India (Sikkim, West Bengal); Nepal.

Platanthera clavigera Lindl., Gen. Sp. Orchid. Pl.: 289. 1835; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 319, t. 420. 1898; Tuyama in Ohashi, Fl. E. Himal. 3: 149. 1975; Chowdhery, Orch. Fl. Arun. Pradh. 602-604. 1998; Bose *et al.* Orch. India. 399. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 186-187. 2002; Lucksom, Orch. Sikkim N.E. Himal. 147. t. 165, pl. 6. 2007; Misra, Orch. India. 314. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1547. 2012; *et J. Interacad.* 16(4): 833. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 16. 2012.

Habenaria densa Wall. *ex* Lindl., Gen. Sp. Orchid. Pl.: 326. 1835; Hook. f., Fl. Brit. India 6: 153. 1890; Bruhl, Guide Orch. Sikkim. 178. 1926; Tuyama in Hara, Fl. E. Himal. 1: 437. 1966; Tuyama in Hara, Fl. E. Himal. 2: 189. 1971; Banerji, Orch. Nepal. 19. 1982.

Platanthera densa (Lindl.) Freyn., Oesterr. Bot. Z. 46: 96. 1896.

Habenaria clavigera (Lindl.) Dandy, J. Bot. 68: 246. 1930; Pradhan, Indian Orch. Guide Identif. Cult. 1: 87. 1976.

Plant terrestrial, tuberous herb, 33-42 cm tall. Stem erect, bracteate. Leaves 3 or 4, 6.2-12.1 × 1.4-3.7 cm, ovate-lanceolate, acute, sessile, sheathing base. Inflorescence

subdensely many-flowered; rachis 7.6-24 cm long; pedicellate-ovary 0.7-1.2 cm long. Flowers 0.7-0.8 cm across, green; floral bracts lanceolate. Dorsal sepal 2.7-3.3 × 1.9-2 mm, elliptic-oblong, obtuse, erect, concave, margins minutely ciliate; lateral pair 3.5-4.5 × 1.8-2.6 mm, oblong-lanceolate, reflexed. Petals 3.5-4 × 1.7-2 mm, elliptic-oblong, obtuse. Lip 3.9-5.7 × 0.8-1.1 mm, simple, linear, obtuse; disc with a transverse callus at base; spur less than 0.6 cm long. Column 0.5-0.6 mm, broad; stigma suborbicular. Anther cells without tubes; pollinia 2.

Flowering : July – September; Fruiting: August – October.
 Specimen cited : Rimbick 2100 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 9290**, dt. 13. 08. 2008.
 Status : Sparse.
 Local distribution : Manaybhanjang, Neora Valley, Toroyok, Rambi forest, Dhotrey, 1900 – 2800 m.
 General distribution : India (Sikkim, West Bengal); Bhutan, China, Nepal.

Platanthera cumminsiana (King & Pantl.) Renz., Edinb. J. Bot. 58(1): 117. 2001; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Pearce & Cribb, Fl. Bhutan, 3(3): 187, t. 188. 2002; Lucksom, Orch. Sikkim N.E. Himal. 146-147. t. 164. 2007; Misra, Orch. India. 314. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1547. 2012; *et J. Interacad.* 16(4): 833. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 16. 2012; *et J. Econ. Taxon. Bot.* 37(1): 31 – 33. 2013.

Habenaria cumminsiana King & Pantl., J. Asiat. Soc. Bengal 64(3): 343. 1896; Bruhl, Guide Orch. Sikkim. 180. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 89. 1976; Bose *et al.* Orch. India. 276. 1999.

Plant terrestrial, tuberous herb, 11-23 cm tall. Stem leafy near base, glabrous. Leaves 3 or 4, 2.5-6 × 2.5-3 cm elliptic to lanceolate, acute, margins slightly undulate, sessile, base sheathing. Inflorescence many-flowered; rachis 4-6 cm long, slightly zigzag; pedicellate-ovary 5-8 mm long. Flowers 5-7 mm across, green; floral bracts lanceolate. Dorsal sepal 3-3.5 × 1.3-2 mm, elliptic-ovate, obtuse, margins hairy, forming hood with petals; lateral pair 3.5-4 × 1.3-2 mm, lanceolate-elliptic, oblique, obtuse, margins hairy. Petals 3-4 × 2 mm, triangular, obtuse, slightly falcate, base truncate, inner margin crenate, fleshy. Lip 3.5-4.5 × 1.2-1.5 mm, simple, spurred, fleshy, oblong, subcylindric, base deflexed, surface warty; spur slender, curved. Column 1.5-2 mm long; pollinia 2.

Flowering : July – August; Fruiting: August – September.
 Specimen cited : Sandakphu 3550 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1375**, dt. 30. 07. 2010.
 Status : Frequent.
 Local distribution : Megma, Kalpokhari, Tonglu, Gairibas, Jaunbari,

2800 – 3600 m.

General distribution : India (North East India, Sikkim, Arunachal Pradesh).

Platanthera edgeworthii (Hook. f. ex Collett) R.K. Gupta, Fl. Nainitalensis: 349. 1968; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Pearce & Cribb, Fl. Bhutan, 3(3): 187 & 189. 2002; Lucksom, Orch. Sikkim N.E. Himal. 147-148. t. 166, pl. 6. 2007; Misra, Orch. India. 314. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1547. 2012; *et J. Interacad.* 16(4): 833. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 16. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 266. 2013.

Habenaria edgeworthii Hook. f. ex Collett, Collett, Fl. Siml.: 504, f.166. 1902; Deva & Naithani, Orch. N.W. Himal. 129 – 131. t. 128. 1986; Pradhan, Indian Orch. Guide Identif. Cult. 1: 89. 1976; Bose *et al.* Orch. India. 278. 1999.

Habenaria acuminata sensu T.A. Rao, Bull. Bot. Burv. Ind. 2: 89. 1960, *non* (Thwaites) Trimen.

Plant terrestrial, tuberous herb, 19-37 cm tall. Stem leafy. Leaves 3-4, 4-7.8 × 2-4.2 cm, lower broadly ovate, oblong-lanceolate up stem, bract-like above, sessile. Inflorescence subdensely many-flowered; rachis 6-21 cm long; pedicellate-ovary twisted. Flowers 3.5-5.1 mm long, green; floral bracts lanceolate. Sepals ciliate; dorsal sepal 3.7-4.1 × 3.3-4 mm, broadly ovate, concave; lateral pair 5.6 × 2.4-2.9 mm broadly ovate, pubescent externally. Petals 4.7-5.9 × 1-1.3 mm, lanceolate, base obliquely triangular, incurved and hooded with the dorsal sepal. Lip 4.7-6 × 1.3-1.9 mm, clawed, spurred; spur more than 1 cm long, spreading upwards. Column 2 mm long; stigma oblong; pollinia 2.

Flowering : June – September; Fruiting: July – October.

Specimen cited : Samanden 2600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0628**, dt. 07. 08. 2008.

Status : Rare.

Local distribution : Megma, Maneybhanjang, Gairibas, Gorkhey, 2400 – 2900 m.

General distribution : India (Sikkim, West Bengal); Bhutan, Nepal, North West Himalaya.

Platanthera exelliana Soo, Ann. Hist.-Nat. Mus. Natl. Hung. 26: 359. 1929; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Bose *et al.* Orch. India. 400. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 189. 2002; Lucksom, Orch. Sikkim N.E. Himal. 142-143. t. 156, pl. 6. 2007; Misra, Orch. India. 314. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1547. 2012; *et J. Interacad.* 16(4): 833. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 17. 2012.

Habenaria oligantha sensu Hook. f., Brit. India 6(1): 154. 1890, *non* Turczaninow 1854; Bruhl, Guide Orch. Sikkim. 181. 1926.

Platanthera elachyantha Tang & Wang, Acta. Phytotax. Sin. 1: 58. 1951.

Plant terrestrial, tuberous herb, 18-34 cm tall. Stem 13-16 cm long. Leaf solitary (rarely 2), 6-10 × 2.5-5 cm, oblong-elliptic, subacute, sessile, base sheathing. Inflorescence laxly 7 to 13-flowered; peduncle with 1 or 2 leafy bracts; rachis 6-10 cm long; pedicellate ovary 6-8 mm long. Flowers 0.6-0.9 cm across, yellowish-green; floral bracts linear-lanceolate. Sepals subequal; dorsal sepal 3.5-4.5 × 1.5-2 mm, oblong to oblong-lanceolate, subacute, margins minutely glandular-ciliate, hooded; lateral pair 3-4.5 × 1.5-1.9 mm, oblong-lanceolate, subacute. Petals 3.4-4.7 × 1-1.7 mm, triangular-lanceolate, subacute, base of lower margins gibbous. Lip 3.6-4.5 × 1-1.8 mm, simple, spurred, fleshy, linear-lanceolate, subacute; spur stout, incurved. Column 0.8-1 mm long. Anther locules c. 1.2 mm long; pollinia 2.

Flowering : June – September; Fruiting: July – October.
Specimen cited : Sandakphu 3500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1681**, dt. 28. 07. 2011.
Status : Sparse.
Local distribution : Bikhaybhanjang, Phalut, 2900 – 4350 m.
General distribution : India (Sikkim, North East India); Bhutan, China, Nepal.

Platanthera leptocaulon (Hook. f.) Soo, Ann. Hist.-Nat. Mus. Natl. Hung. 26: 360. 1929; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 604-609. 1998; Bose *et al.* Orch. India. 402. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 190-191. 2002; Lucksom, Orch. Sikkim N.E. Himal. 143. t. 157, pl. 6. 2007; Misra, Orch. India. 314. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1547. 2012; *et J. Interacad.* 16(4): 833. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 17. 2012.

Habenaria leptocaulon Hook. f., Fl. Brit. India 6(1): 154. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 320, t. 421. 1898; Bruhl, Guide Orch. Sikkim. 182. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 87. 1976.

Platanthera silaensis Handel-Mazzetti, Symb. Sin. 7: 1331, abb.41, 6. 1936.

P. leptocaulon (Hook. f.) Tang & Wang, Acta Phytotax. Sin. 1: 58. 1951.

Plant terrestrial herb, 22-37 cm tall. Stem slender, glabrous. Leaf solitary, 8-12 × 1.5-1.7 cm, linear-oblong, acute, sheathed. Inflorescence laxly 3 to 7-flowered; peduncle with more than 2 leafy bracts; rachis 4-7 cm long; pedicellate-ovary 0.7-1 cm long. Flowers 0.6-0.9 cm across, pale-green; floral bracts lanceolate. Dorsal sepal 4.7-5.5 × 1.5-1.8 mm, oblong-elliptic, acute, connivent with the petals; lateral pair 4.5-5.2 × 1.5-1.6 mm, oblong-elliptic, acute, reflexed. Petals 5-5.4 × 2-2.4 mm, fleshy, lanceolate, subacute, base broadly truncate, falcate. Lip 4.5-5.5 mm long, simple, spurred, oblong-lanceolate, deflexed; spur cylindrical, slightly curved. Column 2-2.5 mm long, stout; pollinia 2.

Flowering : July – August; Fruiting: August – September.
 Specimen cited : Manaybhanjang 2200 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0613**, dt. 06. 08. 2008.
 Status : Frequent.
 Local distribution : Dello Hill, Tonglu, Kalpokhari, Bikhaybhanjang, Chitrey, Megma, Sandakphu, 1800 – 3600 m.
 General distribution : India (North East India, Sikkim, West Bengal); Bhutan, China.

Platanthera stenantha (Hook. f.) Soo, Ann. Hist. Nat. Mus. Natl. Hung. 26: 363. 1925; Tuyama in Ohashi, Fl. E. Himal. 3: 154. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 1: 58. 1976; Deva & Naithani, Orch. N.W. Himal. 187. t. 188. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 609. 1998; Bose *et al.* Orch. India. 402. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 192. 2002; Lucksom, Orch. Sikkim N.E. Himal. 145. t. 161. 2007; Misra, Orch. India. 314. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1547. 2012; *et J. Interacad.* 16(4): 833. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 17. 2012.

Habenaria stenantha Hook. f., Fl. Brit. India 6(1): 153. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 314, t. 412. 1898; Bruhl, Guide Orch. Sikkim. 179. 1926; Banerji, Orch. Nepal. 22. 1982.

Hemihabenaria stenantha (Hook. f.) Finet, Rev. Gen. Bot. 13: 532. 1901.

Plant terrestrial herb, 33-55 cm tall. Stem erect, stout. Leaves 3 or 4, 5-15 × 0.8-5.7 cm, distant along stem, oblong-lanceolate acute, sessile, base sheathing. Inflorescence laxly 10 to 24-flowered; rachis 10-22 cm long; pedicellate-ovary 0.9-1.6 cm long. Flowers 1.1-1.4 cm across, green; floral bracts linear-lanceolate. Dorsal sepal 5-5.9 × 3.6-4 mm, oblong-ovate, obtuse, erect-concave; lateral pair 6.87.2 × 2.5-3 mm, linear-lanceolate, obtuse, deflexed. Petals 7.1-7.6 × 1.3-1.9 mm, linear, obtuse. Lip 7-8 × 1.7-3.5 mm, linear-lanceolate, obtuse, margin entire; spur cylindrical, longer than the ovary. Column 2-2.5 mm tall; pollinia 2.

Flowering : July – September; Fruiting: August – October.
 Specimen cited : Kaiykatay forest 2800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1394**, dt. 02. 08. 2010.
 Status : Rare.
 Local distribution : Kalpokhari, Gairibas, Jalapahar, 1900 – 3500 m.
 General distribution : India (Sikkim, West Bengal); Bhutan, China, Nepal.

Tribe **Diseae** Dressler
Subtribe **Satyrinae** Schltr.

Satyrium Sw.

Plants annual terrestrial herbs; tuberous. Leaves 2-5, elliptic to oblong-lanceolate. Inflorescence terminal, few to many-flowered; bracts often reflexed. Flowers non-resupinate; pedicellate-ovary not twisted. Sepals entire, more or less united to petals and lip at base; dorsal sepal linear to oblong; lateral pair obliquely oblong. Petals spathulate to lanceolate. Lip erect, spurred, more or less hooded, with a broad or narrow mouth and recurved apex; spurs 2, basal, short or long. Column 3-lobed, erect, incurved; stigma forming upper part of the column, cushion like or hooded. Anther pendent; pollinia 2.

The genus *Satyrium* Sw., comprises about 100 species distributed in South Africa, tropical Africa, Madagascar and the Himalayas.

Key to the species

1. Spurs more than 1 cm long; exceeding the ovary..... *S. nepalense*
var. *nepalense*
- 1a. Spurs less than 1 cm long; shorter than the ovary..... *S. nepalense*
var. *ciliatum*

Satyrium nepalense var. *ciliatum* (Lindl.) Hook. f., Fl. Brit. India 6(1): 168. 1890. Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 195. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 1: 43. 1976; Chowdhery, Orch. Fl. Arun. Pradh. 74. 1998; Bose *et al.* Orch. India. 428. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 195, t. 194. 2002; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1548. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 18. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 278. 2013.

Satyrium ciliatum Lindl., Gen. Sp. Orchid. Pl.: 341. 1838; Deva & Naithani, Orch. N.W. Himal. 193. t. 194. 1986; Lucksom, Orch. Sikkim N.E. Himal. 224-225. t. 236, pl. 8. 2007; Misra, Orch. India. 316. 2007.

S. setchuenicum Kranz., Bot. Jahrb. Syst. 29: 266. 1900.

S. yunnanense Rolfe, Notes Roy. Bot. Gard. Edinburgh 8(36): 28. 1913.

S. mairei Schltr., Feddes Repert. Spec. Nov. Regni Veg. Geih. 4: 54. 1919.

S. tenii Schltr., Feddes Repert. Spec. Nov. Regni Veg. 17: 63. 1921.

S. pycnostachyum Schltr., *loc. cit.* 1921.

S. microcephalum Kranz., *op. cit.* 109. 1921.

S. aceras Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 12: 339. 1922.

S. tschangii Schltr., Feddes Repert. Spec. Nov. Regni Veg. 19: 374. 1924.

S. nepalense subsp. *yunnanense* (Rolfe) Soo, Ann. Hist.-Nat. Mus. Natl. Hung. 26: 380. 1929. [Plate 4.22. C]

Plant terrestrial, tuberous herb, 15-37 cm tall; tuber ellipsoid, white. Stem 5-12 cm long, sheathed. Leaves 2-3, 11-14 × 3.1-4.4 cm, oblong-lanceolate, acute, sheathing base. Inflorescence 8-22 cm long, erect, terete, smooth; peduncle 5-10 cm long; rachis 6-12 cm long, erect, with pedicellate flowers; pedicellate-ovary ridged. Flowers 6-8.6 mm across, pinkish-white; floral bracts ovate-lanceolate. Sepals subequal, ciliated margin; dorsal sepal 4.3-5.9 × 1-1.2 mm, oblong, obtuse; lateral pair 5.3-5.8 × 1.8-2 mm, elliptic-oblong, subacute pink, recurved. Petals 4-4.9 × 0.8-1 mm, linear, obtuse, with erose margin. Lip 3-4 mm long, ovate, concave, hooded, keeled at the back, spurs less than 1 cm long, shorter than the ovary. Column 5-5.2 mm long, curved, expanded at the apex. Anther cells turgid; pollinia 2.

Flowering : July – September; Fruiting: August – October.
Specimen cited : Maneybhanjang 2200 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0642**, dt. 08. 08. 2010.
Status : Frequent.
Local distribution : Lava, Algarah, Baggonra, Chitrey, Dhotrey, Rambi forest, Senchale, Serikhola, 1700 – 3500 m.
General distribution : India (North West and North East India, Sikkim, West Bengal); China.

Satyrium nepalense D. Don, Prodr. Fl. Nepal: 26. 1825. Hook. f., Fl. Brit. India 6: 168. 1890; Deva & Naithani, Orch. N.W. Himal. 193–196 t. 195. 1986; Bruhl, Guide Orch. Sikkim. 194. 1926; Tuyama in Hara, Fl. E. Himal. 1: 450. 1966; Tuyama in Hara, Fl. E. Himal. 2: 194. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 164. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 1: 42. 1976; Banerji, Orch. Nepal. 32. 1982; Pradhan & Pradhan, 100 Beaut. Orch. 117. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 74. 1998; Bose *et al.* Orch. India. 428. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 193. 2002; Lucksom, Orch. Sikkim N.E. Himal. 224. t. 235. 2007; Misra, Orch. India. 316. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1548. 2012; *et McAllen* Int. Orchid Soc. J., 13(4): 18. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 280. 2013.

Satyrium perrottetianum A. Rich., Ann. Sci. Nat. (Paris) ser.2, 15: 76. 1841.

S. albiflorum A. Rich., *loc. cit.* 1841.

S. pallidum A. Rich., *op. cit.* 77 1841.

S. henryi Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 4: 53. 1919.

S. nepalense f. *Albiflora* Tuyama, Hara, Fl. E. Himal.: 450. 1966. [Fig. 4.8]

var. *nepalense*

Plant terrestrial herb, 22-56 cm tall; tubers ovoid-cylindric. Stem stout, bracteate above. Leaves 3-5, 8-19 × 2.7-5.4 cm, narrowly elliptic, sub acute, sheathing at base. Inflorescence densely 14- to 31-flowered; peduncle 11-26 cm long, covered with

bracts; rachis 5-8 cm long; pedicellate-ovary 6-7 mm long. Flowers 0.9-1.5 cm across, pink; floral bracts leaf-like, oblong-lanceolate, deflexed. Dorsal sepal 5.5-6 × 1-1.5 mm, oblanceolate-spathulate, obtuse; lateral pair 5.6-6 × 1.7-2.3 mm, oblong, glandular. Petals 4.6-5.2 × 1-1.2 mm, narrower than the sepals, obtuse. Lip 0.8 × 1 cm, broadly oblong, hooded and keeled on the back; spurs 2, more than 1 cm long, exceeding the pedicellate-ovary. Column short, curved. Anther broad; pollinia 2.

Flowering	: August – October; Fruiting: September – November.
Specimen cited	: Sandakphu 3400 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1411 , dt. 11. 08. 2008.
Status	: Rare.
Local distribution	: Kalpokhari, Tonglu, Megma, Lava, Chitrey, Dhotrey, Rambi forest, Senchale, Serikhola, 2300 – 4300 m.
General distribution	: India (Sikkim, West Bengal); Bhutan, Myanmar, Sri Lanka.

Subtribe **Diplomeridinae**

Diplomeris D. Don

Plants small annual terrestrial (lithophytic) deciduous herbs; tuber spherical. Stems very short. Leaf solitary or 2, large, oblong to ensiform, hairy or glabrous. Inflorescence solitary or 2-flowered. Flowers snow white colour. Sepals subequal, lanceolate, free, spreading. Petals much larger than the sepals. Lip adnate to the base of the column by a long claw, spurred; lamina spreading, broad, entire to minutely 3-lobed at apex. Column very short; rostellum large, erect, membranous. Anther locules parallel; pollinia 2.

The genus *Diplomeris* D. Don., comprises 4 species occurring in India, Nepal and China.

Diplomeris hirsuta (Lindl.) Lindl., Gen. Sp. Orchid. Pl.: 330. 1835; Hook. f., Fl. Brit. India 6: 167. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 194. 1926; Tuyama in Ohashi, Fl. E. Himal. 3: 141. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 1: 43. 1976; Deva & Naithani, Orch. N.W. Himal. 113. t. 114. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 83. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 331-339. 1998; Bose *et al.* Orch. India. 223. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 143, t. 142. 2002; M. Pradhan, 100 N.E. Indian Orch. 50-51. 2006; Lucksom, Orch. Sikkim N.E. Himal. 217. t. 226, pl. 8. 2007; Misra, Orch. India. 295. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et*

McAllen Int. Orch. Soc. J., 13(4): 10. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 180. 2013.

Diplochilus hirsuta Lindl., Bot. Reg. 18: *sub t.*1499. 1832.

D. hirsuta var. *biflora* Pradhan, Amer. Orchid Soc. Bull. 43(6): 525. 1974.

Plant lithophytic, tuberous herb, 4-6 cm tall. Stem 2.6-3.3 cm long, sparsely hairy. Leaf solitary, 3.3-7.6 × 1.2-3.6 cm, basal, oblong, subacute, base minutely cordate, sessile, hairy, base sheathing. Inflorescence 1 or 2-flowered; pedicellate-ovary hairy. Flower 2.6-3.1 cm across, white; floral bracts ovate. Dorsal sepal 1.2-1.5 × 0.7-0.8 cm, ovate-oblong, subacute, hairy externally; lateral pair 1.2-1.7 × 0.7-0.8 cm, oblong-ovate, falcate, pubescent externally. Petals 1-1.7 × 0.7-1.6 cm, orbicular-reniform, subacute. Lip 1.8-2.2 × 2.1-2.3 cm, simple, spurred, clawed at base; apical lobe ovate-orbicular, apex 2-lobed, emarginated, mucronate, midrib thick; spur infundibuliform at mouth, cylindrical, curved. Column 0.4-0.6 cm tall; stigma large, slender, erect. Anther locules triangular with long tubes; pollinia 2.

Flowering : June – August; Fruiting: August – September.

Specimen cited : Kalijhora Road side 300 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1333**, dt. 20. 07. 2010.

Status : Sparse.

Local distribution : Near Coronation Bridge sides, Latpanjar, 200 – 900 m.

General distribution : India (Arunachal Pradesh, Sikkim); China, Nepal.

Subfamily **Epidendroideae** Lindl.

Tribe **Malaxideae** Lindl.

Liparis Rich.

Plant terrestrial or epiphytic herb; pseudobulbous. Leaf solitary to several, plicate, base sheathing. Inflorescence terminal, erect, laxly few to many flowered. Flowers small in terminal racemes. Sepals free, spreading or recurved. Petals filiform to linear, much narrower than the sepals. Lip usually recurved, entire to 3-lobed, acute, obtuse or emarginated, sometimes callose. Column usually elongate, incurved, usually winged near the apex. Anther terminal; pollinia 4, clavate or oblique.

The genus *Liparis* Rich., comprises about 250 species widespread in the tropics of the world and less common, but still widespread, in the temperate regions.

Key to the species

1. Plants with non-jointed, usually
membranous, leaves; usually terrestrial.....2
- 1a. Plants with jointed, often
coriaceous, leaves; usually epiphytic.....8

2. Plants with solitary leaf.....3
- 2a. Plants with 2 or more leaves.....4

3. Leaf cordate;
floral bracts more than 7 mm long;
flower more than 1 cm long, *L. cordifolia*
- 3a. Leaf not cordate;
floral bracts less than 5 mm long;
flowers less than 6.5 mm long..... *L. gamblei*

4. Petals spatulate, 3 or more nerves;
leaves narrowly elliptic-lanceolate *L. odorata*
- 4a. Petals linear, solitary nerved;
leaves broadly elliptic-ovate5

5. Plant 3 to 7-leaved *L. nervosa*
- 5a. Plant with 2 (rarely 4-5) leaves) 6

6. Flowers yellowish-green; lip cuneate, *L. dongchenii*
- 6a. Flowers not yellowish-green; lip not cuneate7

7. Floral bracts less than 2 mm long; leaf tip subacute *L. cathcartii*
- 7a. Floral bracts more than 4 mm long;
leaf tip acuminate *L. deflexa*

8. Pseudobulb with solitary leaf9
- 8a. Pseudobulbs with 2 or more leaves11

9. Sepals with 3 or more nerves *L. bootanensis*
- 9a. Sepals with solitary nerved10

10. Lip lacking distinct side lobes *L. cespitosa*
- 10a. Lip with distinct side lobes *L. duthiei*

11. Plants often very small; leaves linear-oblong,
less than 1 cm wide.....12
- 11a. Plants medium to large in size;

- leaves oblong to elliptic, more than 1 cm wide.....14
12. Plant more than 13 cm tall;
leaves more than 6 cm long13
- 12a. Plant less than 13 cm tall;
leaves less than 6 cm long*L. platyrachis*
13. Flowers small, 4.5-7 mm long*L. resupinata*
- 13a. Flowers large, 1.2-1.5 cm long.....*L. resupinata* var. *ridleyi*
14. Sepals with 3-5 nerves.....*L. plantaginea*
- 14a. Sepals with solitary nerve15
15. Pseudobulbs short or long and stem like,
more than 10 cm tall; lip lacking ear-like margins*L. viridiflora*
- 15a. Pseudobulbs short, less than 4.5 cm tall;
lip with ear-like folds at margins*L. somai*

Liparis bootanensis Griff., Itin. Pl. Khasyah Mts.: 98. 1848; Not. Pl. Asiat. 3: 278. 1851; Hook. f., Fl. Brit. India 5: 700. 1890; Bruhl, Guide Orch. Sikkim. 50. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 228. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 468-472. 1998; Bose *et al.* Orch. India. 305. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 204, t. 205. 2002; Lucksom, Orch. Sikkim N.E. Himal. 283. t. 302, pl. 10. 2007; Misra, Orch. India. 305. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* Life Sci. Leafl. 4: 20-21. 2013.

L. lancifolia Hook. f., Icon. Pl. ser.3 (19): 1855. 1889; Fl. Brit. India 5(2): 700. 1890.

L. subplicata Tang & Wang, Acta Phytotax. Sin. 12(1): 40. 1974.

L. ruybarrettoi S.Y. Hu & Barrette, Chung Chi J. 13(2): 22. 1976.

L. pterostyloides Szlach., Fragm. Florist. Geobot. 38(2): 454. 1993.

Liparis pachypus Par. & Reichb. f., Trans. Linn. Soc. 30: 155. 1974. [Fig. 4.9]

Plant epiphytic herb, 13-26 cm tall. Pseudobulbs 2.2-3.5 × 0.8-1.3 cm, narrowly cylindrical, sheathed. Leaf solitary, 13-18 × 2.2-3.2 cm, linear-oblong, acute, petiolate. Inflorescence 16-19 cm long, laxly 9 to 15-flowered; peduncle 6-8 cm long; rachis 8-10 cm long; pedicellate-ovary 0.8-1.2 cm long. Flowers 0.5-0.6 cm long, green; floral bracts linear-lanceolate. Sepals subsimilar, linear-lanceolate, 3 or more nerves. Dorsal sepal 0.8-1 × 0.1-0.2 cm, slightly reflexed, edges revolute; lateral pair 18 × 1 mm, projecting beyond the lip. Petals 0.7-0.9 × 0.1-0.2 cm, linear, obtuse, decurved, edges revolute. Lip 0.8-1 × 0.6-0.8 cm, wedge-shaped to oblong, deflexed; base 2-auriculate with 2 erect calluses; apex broad, truncate, mucronate. Column 0.4-0.5 cm long, curved, with 2 long, subpendent, hook like wings at apex. Pollinia 2.

Flowering : June – August; Fruiting: July – September.

Specimen cited	: Todey forest 1500 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1337 , dt. 20. 07. 2010.
Status	: Sparse.
Local distribution	: Lava, Rimbick, Toroyok, Jalapahar, Pattabong, Takdah, 1300 – 2300 m.
General distribution	: India (North East India, Sikkim, West Bengal); Bhutan, China, Japan, Malaysia, Myanmar, Philippines, Thailand, Vietnam.

Liparis cathcartii Hook. f., Icon. Pl. ser.3(19): t.1808. 1889; Fl. Brit. India 5(2): 694. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 50. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 224. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 472. 1998; Bose *et al.* Orch. India. 307. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 198. 2002; Lucksom, Orch. Sikkim N.E. Himal. 280-281. t. 297. 2007; Misra, Orch. India. 305. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 12. 2012; *et* Life Sci. Leafl. 4: 21. 2013.
Liparis repestris sensu Ridl., J. Linn. Soc., Bot. 22: 268. 1886.

Plant terrestrial herb, 11-22 cm tall. Pseudobulbs 1.4-2 × 0.7-1.1 cm, narrowly ovoid. Leaves 2, 4-9 × 2.5-5 cm, subopposite, elliptic-ovate, subacute, sheathing petiole. Inflorescence laxly many-flowered; rachis 4.5-7.5 cm long; pedicellate-ovary linear. Flowers 1.1-1.5 cm long, greenish-purple; floral bracts less than 2 mm long. Sepals similar; dorsal sepal 7-8 × 1.2-1.5 mm, oblong, obtuse, spreading, edges recurved; lateral pair 7-8 × 0.8-1 mm, appressed to lower surface of lip. Petals 9.5-12 × 0.2-0.4 mm, linear, curved and reflexed. Lip 0.8-1 × 0.7-0.9 cm, flat, obovate; base clawed, cordate, with 2 obscure calluses; apex truncate, erose. Column 3-4 mm long, slender, curved, with 2 short, broad wings. Anther sub quadrate; pollinia 4.

Flowering	: April – July; Fruiting: June – August.
Specimen cited	: Jarebutti forest – Neora Valley 2300 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0313 , dt. 18. 04. 2008.
Status	: Rare.
Local distribution	: Tonglu, Kalpokhari, Senchale, 2000 – 3100 m.
General distribution	: India (Sikkim, West Bengal); Bhutan, China, Japan, Laos, Myanmar, Nepal, Taiwan, Thailand, Vietnam.

Liparis cespitosa (Lamk.) Lindl., Bot. Reg. 11: sub t.882. 1825; Tuyama in Ohashi, Fl. E. Himal. 3: 160. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 232. 1979; Deva & Naithani, Orch. N.W. Himal. 284 – 285. t. 286. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 472. 1998; Bose *et al.* Orch. India. 305. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 204 & 206. 2002; Lucksom, Orch. Sikkim N.E. Himal. 284. t. 304, pl.

10. 2007; Misra, Orch. India. 305. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* Life Sci. Leafl. 4: 21. 2013.

Epidendrum caespitosa Lamk., Encycl. 1: 187. 1783.

Malaxis caespitosa Thou., Hist. Orchid.: t.90. 1822.

L. pusilla Ridl., J. Linn. Soc., Bot. 22: 294. 1886; Hook. f., Fl. Brit. India 5: 701. 1890; Bruhl, Guide Orch. Sikkim. 51. 1926.

L. prainii Hook. f., Icon. Pl. ser.3(19): t.1857a. 1889.

L. duthiei Hook. f., op. cit. t.1857B. 1889.

Cestichis caespitosa (Thou.) Ames, Orchidaceae 2: 132. 1908.

Liparis polanei Gagnep., Bull. Soc. Bot. France 76: 514. 1929.

L. laurisilvatica Fukuyama, Rep. (Annual) Taihoku Bot. Gard. 3: 83. 1933.

Plant epiphytic herb, 7-16 cm tall. Pseudobulbs 1.6-2.2 × 0.8-1.1 cm, ovoid, smooth. Leaf solitary, 7-12 × 1-1.4 cm, from apex of pseudobulb, stiff, oblanceolate. Inflorescence 8-10 cm long, densely 13 to 28-flowered; peduncle 3-5 cm long; rachis 3.5-5 cm long, glabrous; pedicellate-ovary 3-5 mm long. Flowers 1.6-2.1 mm long, pale-green; floral bracts lanceolate. Sepals similar, ovate, acute, reflexed, 1-nerved; dorsal sepal 2-2.7 × 0.6-0.9 mm; lateral pair 2.4-2.9 × 0.9-1 mm. Petals 2-3 × 0.8-1 mm, linear, obtuse, reflexed. Lip 2.5-2.7 × 1.5-2 mm, oblong, apiculate, with 2 small calluses at base. Column 1-1.2 mm long, curved. Pollinia 4.

Flowering : July – September; Fruiting: August – October.

Specimen cited : Rimbick 2100 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0538**, dt. 29. 06. 2008.

Status : Sparse.

Local distribution : Today, Lava, Manibhanjang, Nockdara, Rimbick, Sonada, 1800 – 2200 m.

General distribution : India (Sikkim, West Bengal); Bhutan, Nepal, Africa to Pacific.

Liparis cordifolia Hook. f., Icon. Pl. ser.3(19): t.1811. 1889; Hook. f., Fl. Brit. India 5: 682. 1890; Hedge & A.N. Rao, Indian J. Forestry 7(1): 77. 1984; Bruhl, Guide Orch. Sikkim. 48. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 217. 1979; Banerji, Orch. Nepal. 71. 1982; Deva & Naithani, Orch. N.W. Himal. 285. t. 287. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 472-476. 1998; Bose *et al.* Orch. India. 307. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 198. 2002; Lucksom, Orch. Sikkim N.E. Himal. 277-278. t. 291, pl. 9. 2007; Misra, Orch. India. 305. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 12. 2012; *et* Life Sci. Leafl. 4: 22. 2013.

Liparis keitaoensis Hayata, Icon. Pl. Formos. 7: 40, t.13. 1918.

L. sekiteiensis Kudo *ex* Masamune, J. Geobot. 18(1): t.158. 1970. [Fig. 4.10]

Plant terrestrial herb, 10-19 cm tall. Pseudobulbs 2-3.8 × 1.3-2.3 cm long, crowded, compressed, ovoid, acute. Stem 3-4 mm wide, with triangular bracts. Leaf solitary, 3.5-9.3 × 3.2-8.2 cm, cordate, acuminate, base sheathing. Inflorescence subdensely 7 to 19-flowered; rachis 3.8-5.3 cm long; pedicellate-ovary 0.9-1 cm long. Flowers 1.4-1.9 cm long, green; floral bracts less than 7 mm long. Sepals similar, 9-10 × 1.4-1.8 mm, linear-lanceolate, acute. Petals 9-10 × 1.1-1.3 mm, linear, spreading. Lip 8-9 × 9-10 mm, obovate-deltoid, triangular, flat with concavity at base; apex truncate; margin crenulate. Column 4-5 mm long, curved, expanded at base, apex winged. Pollinia elongated.

Flowering : October–November; Fruiting: November–December.
 Specimen cited : Takdah forest 1700 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1515**, dt. 27. 10. 2010.
 Status : Threatened.
 Local distribution : Damsang Gari, Algarah, 550 – 2000 m.
 General distribution : India (North West Himalaya to Assam); Bhutan and China.

Liparis deflexa Hook. f., Fl. Brit. India 5(2): 697. 1890; Icon. Pl. ser.4(21): t.2008. 1892; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 49. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 222. 1979; Deva & Naithani, Orch. N.W. Himal. 285 – 288. t. 289. 1986; Bose *et al.* Orch. India. 307. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 198-199. 2002; Lucksom, Orch. Sikkim N.E. Himal. 278-279. t. 294. 2007; Misra, Orch. India. 305. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et McAllen* Int. Orch. Soc. J., 13(4): 12. 2012; *et Life Sci. Leafl.* 4: 22. 2013; Misra, Orch. Odisha. 112-113. 2014.

Liparis prazeri King & Pantl., J. Asiat. Soc. Bengal 66(3): 582. 1897.

Plant terrestrial herb, 23-37 cm tall. Pseudobulbs 0.8-1 × 0.5-0.7 cm, cylindrical, sheathed. Leaves 2, 7-10 × 3-5 cm, basal, plicate, elliptic-lanceolate, acuminate. Inflorescence laxly 14 to 20-flowered; peduncle 8-13 cm long, bracteate; rachis 7-13 cm long; pedicel and ovary 6-9 mm long. Flowers 0.8-1 cm across, greenish-yellow; floral bracts deflexed, more than 4 mm long. Sepals subsimilar, 4-6 × 1-2 mm, narrowly oblong; dorsal sepal acute; lateral pair obtuse. Petals 4-6 × 0.3-0.4 mm, linear-oblong, obtuse, reflexed with recurved margins. Lip 4-8 × 5-6 mm, orbicular-reniform, contracted at junction with the column, margins at base entire, calluses 2; apex broad, margins crenulate, emarginated, mucronate. Column curved, 2-3 mm long, wings near apex. Anther ovate; pollinia clavate.

Flowering : July – August; Fruiting: August – September.
 Specimen cited : Algarah forest 1600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1649**, dt. 15. 07. 2011

Status : Rare.
Local distribution : Kalimpong 15th Mile, Tungsong, 600 – 1600 m.
General distribution : India (North East India, West Bengal, Sikkim);
Myanmar and Nepal.

Liparis dongchenii Lucksom, J. Forestry, 23(1) 113-115. 2000; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Lucksom, Orch. Sikkim N.E. Himal. 282-283. t. 301, pl. 10. 2007; Misra, Orch. India. 305. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 12. 2012; *et* Life Sci. Leafl. 4: 22. 2013.

Plant terrestrial herb, stem 10-11 cm long, erect, sheathed. Leaves 4-5, 11-15 × 2-8 cm, elliptic ovate, acuminate, plicate. Inflorescence 10-42 cm, erect, 8 to many flowers, ribbed or winged, glabrous; peduncle 7-12.5 cm long; rachis 3-20.5 cm long; pedicellate-ovary winged. Flowers 1.3-2 cm across, yellowish-green; floral bracts oblong-ovate. Sepals sub-equal, linear reflexed, obtuse; dorsal sepal 1.2-1.5 × 0.18-0.2 cm, oblong ovate; lateral pair 1-1.3 × 0.35-0.4 cm, 3-nerved. Petals 1-1.3 × 0.4-0.5 cm, light green, convolute margin and reflexed. Lip 1.3-1.5 × 1.1 cm, broadly cuneate, concave at base, deflexed about the middle, 5-lamellae on disc; epichile margin erose. Column c. 6.6 × 1.2 mm, slightly winged, glabrous. Anther 2-chambered; pollinia 4.

Flowering : June – August; Fruiting: July – September.
Specimen cited : Kumsi forest 650 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0593**, dt. 01. 08. 2008.
Status : Rare.
Local distribution : Panbu, Nimbong, Pudung-Sendaybong, Sittong,
600 – 1000 m.
General distribution : India (Sikkim).

Liparis duthiei Hook. f., op. cit. t.1857B. 1889; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 48. 1926; Tuyama in Hara, Fl. E. Himal. 2: 190. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 137. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 232. 1979; Bose *et al.* Orch. India. 309. 1999; Lucksom, Orch. Sikkim N.E. Himal. 284-285. t. 305. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* Life Sci. Leafl. 4: 23. 2013.

Plant epiphytic herb, 5-11 cm tall. Pseudobulb tufted, ovoid, sheathed. Stem erect. Leaf solitary, 3.8-9 × 0.6-1.1 cm, linear-oblong, acute, petiolate. Inflorescence 2.5-7 cm long, erect; peduncle 1.5-3.5 cm long; rachis 1-3.5 cm long, 8- to 17-flowers; pedicellate-ovary terete, smooth. Flowers 3 mm long, pale whitish-green; floral bracts minute. Sepal sub-equal, elliptic oblong, sub-acute, reflexed; dorsal sepal 1.9-2.7 × 0.3-0.4 mm; lateral pair 1.9-2.9 × 0.5-0.9 mm. Petals 2-2.2 × 0.2 mm

long, linear, recurved. Lip 2.5×1.7 mm long, quadrate, narrowed to the base, decurved about the middle, edges near the base with two thickened processes; side of the lip entire, acuminate, sub-truncate, margin minutely erose. Column 1.3 mm long, slightly curved, obscurely winged at the apex thickened at base. Anther ovate; pollinia 4.

Flowering : June – August; Fruiting: July – September.
Specimen cited : Najoke forest 500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1321**, dt. 13. 07. 2010.
Status : Threatened
Local distribution : Relli river sides, Kumsi, 400 – 1500 m.
General distribution : India (North West India, Sikkim, West Bengal).

Liparis gamblei Hook. f., Icon. Pl. ser.3(19): t.1812. 1889. Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 50. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 217. 1979; Bose *et al.* Orch. India. 309. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 199. 2002; Lucksom, Orch. Sikkim N.E. Himal. 278. t. 292. 2007; Misra, Orch. India. 305. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 12. 2012; *et* Life Sci. Leafl. 4: 23. 2013.

Plant terrestrial herb, 13-18 cm tall. Pseudobulbs $0.8-1.5 \times 1-1.3$ cm, ovoid. Leaf solitary, $4-9 \times 3-4.7$ cm, oblong-elliptic, acute to acuminate, base sheathing. Inflorescence subdensely many-flowered; peduncle 4-7.5 cm long, ridged, ebracteate; rachis 5.5-7.5 cm long; pedicellate-ovary 7-9 mm long. Flowers 5-6.5 mm long, green; floral bracts less than 5 mm long. Sepals similar, $6-7 \times 1.6-2$ mm, ovate-lanceolate, acute, 1-nerved. Petals $5-8 \times 0.3-0.4$ mm, linear, spreading, 1-nerved. Lip $5-6.5 \times 2-4$ mm, simple, elliptic-obovate, apex acute, margin wavy-crenate, base 2-calloses. Column 2.5-3.4 mm long, curved. Anther dome shaped; pollinia 4.

Flowering : June – July; Fruiting: July – August.
Specimen cited : Takdah forest 1800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1259**, dt. 24. 06. 2010.
Status : Rare.
Local distribution : Budhabaray forest, Senchale, Jalapahar, Megma, 1600 – 2400 m.
General distribution : India (North East India, East Bengal).

Liparis nervosa (Thunb.) Lindl., Gen. Sp. Orchid. Pl.: 26. 1830; Hook. f., Fl. Brit. India 5: 857. 1890; Tuyama in Ohashi, Fl. E. Himal. 3: 159. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 223. 1979; Deva & Naithani, Orch. N.W. Himal. 288–292. t. 291. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 74. 1998; Bose *et al.* Orch.

India. 311. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 199-200. 2002; M. Pradhan, 100 N.E. Indian Orch. 52-53. 2006; Lucksom, Orch. Sikkim N.E. Himal. 282. t. 300, pl. 10. 2007; Misra, Orch. India. 305. 2007; Chowdhery & Agrawala, A Century W.H. Orch. 238. 2013; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 12. 2012; *et* Life Sci. Leafl. 4: 23-24. 2013; Misra, Orch. Odisha. 120-121. 2014.

Ophrys nervosa Thunb., Fl. Jap.: 27. 1784.

Epidendrum nervosum (Thunb.) Thunb., Mus. Nat. Acad. Upsal. 9: 138. 1791.

Cymbidium nervosum (Thunb.) Sw., Nova Acta Regiae Soc. Sci. Upsal. 6: 76. 1799.

Malaxis nervosa (Thunb.) Sw., Kongl. Vetensk. Acad. Nya. Handl. 21: 235. 1800.

Cymbidium bituberculatum Hook., Exot. Fl. 2: t.116. 1824.

Liparis bituberculata (Hook.) Lindl., Bot. Reg. 11: sub t.882. 1825; Hook. f., Fl. Brit. India 5: 696. 1890; Bruhl, Guide Orch. Sikkim. 49. 1926.

Sturmia nervosa (Thunb.) Rchb. f., Bonplandia 3: 250. 1855.

L. macrocarpa Hook. f., Fl. Brit. India 5(2): 696. 1890.

Leptorchis bituberculata (Hook.) Kuntze, Revis. Gen. Pl. 2: 671. 1891.

Liparis nervosa f. *aureovariegata* Nakajima, J. Geobot. 17: 55. 1969.

L. nervosa var. *formosana* (Rchb. f.) Hiroe, Orchid flowers 2: 77. 1971.

L. shaoshunia S.S. Ying, Col. Illustr. Indigo. Orch. Taiwan 1: 230. 1977.

Plant terrestrial herb, 29-42 cm tall. Pseudobulbs conical, sheathed. Stem erect, longer than the leaves, glabrous. Leaves 3-7, 7-20 × 3.2-7.1 cm, plicate, broadly elliptic-ovate, acute, sheathing. Inflorescence laxly many-flowered; peduncle 8-11 cm long; rachis 8-17 cm long; pedicellate-ovary cylindrical. Flowers 1.5-1.9 cm across, pale yellow; floral bracts ovate. Sepals subsimilar, reflexed; dorsal sepal 9-11 × 1-1.6 mm, elliptic-oblong, acute, margins revolute; lateral pair 7-9 × 1.7-2.5 mm, falcate-ovate, acute, margins revolute. Petals 7-9 × 0.7-1 mm, reflexed, linear-oblongate. Lip 7-9 × 3-4 mm, wedge-shaped, yellowish-green with purple markings, flabellate, 2-lobed in front, strongly recurved, 2 caluses at base. Column 5-7 mm long, curved, thin-margined, winged. Anther 2 chambered; pollinia 4.

Flowering : May – August; Fruiting: July – September.

Specimen cited : Takdah forest 1100 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1116**, dt. 05. 04. 2010.

Status : Sparse.

Local distribution : Algarah, Dello Hill, Lava, Rambh forest, Manaybhanjang, 900 – 2300 m.

General distribution : India (North West India, Sikkim, West Bengal); Nepal.

Liparis odorata (Willd.) Lindl., Gen. Sp. Orchid. Pl.: 26. 1830; Pradhan, Indian Orch. Guide Identif. Cult. 2: 222. 1979; Pearce & Cribb, Fl. Bhutan, 3(3): 201-202. 2002; Lucksom, Orch. Sikkim N.E. Himal. 279-280. t. 296, pl. 9. 2007; Misra, Orch. India. 305. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et*

McAllen Int. Orch. Soc. J., 13(4): 13. 2012; *et* Life Sci. Leaflet. 4: 24. 2013; Misra, Orch. Odisha. 116-117. 2014.
Malaxis odorata Willd., Sp. Pl. ed.4(1): 91. 1805.
M. lancifolia J.E. Sm., Rees, Cycl. 22: 7. 1812.
Empusa paradoxa Lindl., Bot. Reg. 10: sub t.825. 1824.
Liparis paradoxa (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 218. 1861; Hook. f., Fl. Brit. India 5: 697. 1890; Bruhl, Guide Orch. Sikkim. 49. 1926; Deva & Naithani, Orch. N.W. Himal. 292. t. 293. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 483. 1998; Bose *et al.* Orch. India. 311. 1999.
L. paradoxa var. *parishii* Hook. f., Fl. Brit. India 5(2): 698. 1890.
L. parishii (Hook. f.) Hook. f., op. cit. 6(1): 182. 1890.
Leptorchis odorata (Willd.) Kuntze, Revis. Gen. Pl. 2: 671. 1891.
Liparis guamensis Ames, Philipp. J. Sci. 9: 11 1914.
L. tenii Schltr., Feddes Repert. Spec. Nov. Regni Veg. 17: 66. 1921.
L. teniana Kranz., op. cit. 112. 1921.
L. simeonis Schltr., op. cit. 20: 383. 1924.
L. odorata var. *longiscapa* Rolfe *ex* Downie, Bull. Misc. Inform. Kew 1925: 370. 1925.
L. odorata var. *intacta* Kerr, op. cit. 1927: 216. 1927.
L. tonkinensis Gagnep., Bull. Soc. Bot. France 79: 167. 1932.
L. longiscapa (Rolfe) Gagnep. & Guillaumin, Lecompte, Fl. Indo.-Chine. 6: 182. 1932.

Plant terrestrial herb, 15-37 cm tall. Pseudobulbs 1.3-1.8 × 0.1-1.9 cm, narrowly ovoid-conical, sheathed. Leaves 2 or 3, 7-20 × 2.4-3.5 cm, alternate, elliptic-lanceolate, acute, plicate. Inflorescence 6 to 20-flowered; peduncle 17-24 cm tall, bracteolate; rachis 7-8 cm long; pedicellate-ovary twisted. Flowers 0.6-0.7 cm across, green; floral bracts ovate-lanceolate. Dorsal sepal 6-7 × 2 mm long, linear, obtuse, spreading, margins recurved; lateral pair 5-6 × 3 mm long, ovate, recurved. Petals 6-7 × 1 mm long, spatulate, reflexed, margins recurved. Lip 3-4 × 4.5-4.7 mm long, dull purple, deflexed at the middle, edges entire; apex emarginated, erose; calluses 2, erect tooth-like. Column 4-5 × 1.4-1.6 mm, crenulate, apex winged. Anther 2-chambered; pollinia 4.

Flowering	: June – August; Fruiting: July – September.
Specimen cited	: Kafer forest 1500 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0587 , dt. 01. 08. 2008.
Status	: Frequent.
Local distribution	: Dello Hill, Durpin-Kalimpong, Tunsong, Todey forest, 800 – 2000 m.
General distribution	: India (Sikkim, West Bengal); Bhutan, China, Laos, Myanmar, Nepal, Taiwan, Thailand and Vietnam.

Liparis plantaginea Lindl., Gen. Sp. Orchid. Pl.: 29. 1830; Hook. f., Fl. Brit. India 5: 702. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 29, t. 36. 1898; Bruhl, Guide Orch. Sikkim. 52. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 229. 1979; Hedge, Orch. Arun. Pradh. 41. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 483-487. 1998; Bose *et al.* Orch. India. 313. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 208-209. 2002; Lucksom, Orch. Sikkim N.E. Himal. 287. t. 311, pl. 11. 2007; Misra, Orch. India. 305. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* McAllen Int. Orchid Soc. J., 13(4): 13. 2012; *et* Life Sci. Leafl. 4: 24. 2013.

Liparis selligera Rchb. f., Linnaea 41: 42. 1877.

L. orbicularis Loddiges *ex* Hemsley, Gard. Chron. n.s. 16: 592. 1881.

L. griffithii Ridl., J. Linn. Soc., Bot. 22: 285. 1886.

Plant epiphytic herb, 28-37 cm tall. Pseudobulbs 5-8 × 1-1.6-2.9 cm, narrowly ovoid-cylindric, compressed, sheathed. Leaves 2, 20-34 × 5.7-6.5 cm, subopposite, oblong-elliptic, acute, petiolate. Inflorescence laxly 10 to 14-flowered; peduncle 7-10 cm long, compressed; rachis 11-15 cm long; pedicellate-ovary 1.4-1.9 cm long. Flowers 1.2 cm long, green; floral bracts ovate-lanceolate. Sepals similar, 0.9-1.2 × 0.2-0.3 cm, oblong-lanceolate, subacute, margins revolute, 3-5 nerves; dorsal sepal spreading; lateral pair parallel, under the lip. Petals 1.1 × 0.1 cm long, decurved, linear, revolute. Lip 0.9-1 × 0.9-1.1 cm, concave, clawed, suborbicular, margins erose-dentate, decurved near base; callus 2-lobed. Column 0.5-0.6 cm long, curved. Anther 2 locular; pollinia 4.

Flowering	: June – August; Fruiting: July – September.
Specimen cited	: Tangta forest 2000 m, Rajendra Yonzon, D. Lama and R. B. Bhujel 0665 , dt. 13. 08. 2008.
Status	: Common.
Local distribution	: Today, Lava, Neora Valley, Takdah, Sukiapokhari, Manaybhanjang, Jalapahar, Dhotrey, 1800 – 2200 m.
General distribution	: India (Sikkim, West Bengal); Bhutan, Thailand and Vietnam.

Liparis platyrachis Hook. f., Icon. Pl. ser.3(19): t.1890. 1889; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 54. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 234. 1979; Banerji, Orch. Nepal. 71. 1982; Deva & Naithani, Orch. N.W. Himal. 292 – 295. t. 294. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 34. 1997; Bose *et al.* Orch. India. 313. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 209. 2002; Lucksom, Orch. Sikkim N.E. Himal. 289. t. 316, pl. 11. 2007; Misra, Orch. India. 305. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* Life Sci. Leafl. 4: 24-25. 2013.

Plant epiphytic herb, 5-13 cm tall. Pseudobulbs 1.5-2.5 × 0.5-0.8 cm, tufted, cylindrical, compressed. Leaves 3-5, 2.5-4 × 0.3-0.8 cm, linear-lanceolate, acute, glabrous, base sessile. Inflorescence solitary, pendent, elongate, 10 to 20-flowered; peduncle 2-5 cm long; rachis 7-13 cm long; pedicel and ovary 3-4 mm long. Flowers 5-6.5 mm across, pale green; floral bracts minute. Dorsal sepal 2.5-3 × 0.8-1.1 mm, elliptic, obtuse; lateral pair 2-3 × 0.6-0.8 mm, elliptic, subacute, margins recurved. Petals 2-3 × 0.07-0.1 mm, linear, obtuse, decurved, margins revolute. Lip 2-2.5 × 0.8-1.1 mm, quadrate, deflexed at middle; base with 4 calli, 2 conical, erect, 2 triangular, depressed; apex broad, round, apiculate. Column 1.5-2 mm long, erect. Anther ovate; pollinia 4.

Flowering : September – October; Fruiting: October – November.
 Specimen cited : Todey forest 1300 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1705**, dt. 09. 10. 2011.
 Status : Rare.
 Local distribution : Algarah forest, Durpin-Kalimpong, Kafer, Lopchu, Takdah, 1200 – 1800 m.
 General distribution : Nepal, North East India and China (Yunnan).

Liparis resupinata Ridl., J. Linn. Soc., Bot. 22: 290. 1886; Hook. f., Fl. Brit. India 5: 705. 1890; Bruhl, Guide Orch. Sikkim. 53. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 237. 1979; Banerji, Orch. Nepal. 72. 1982; Deva & Naithani, Orch. N.W. Himal. 295. t. 296. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 487. 1998; Bose *et al.* Orch. India. 315. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 209-210. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 52-53. 2005; Lucksom, Orch. Sikkim N.E. Himal. 290. t. 317, pl. 11. 2007; Misra, Orch. India. 305. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* Life Sci. Leafl. 4: 25. 2013.

Liparis ridleyi Hook. f., Icon. Pl. ser. 3(19): t.1887. 1889; Fl. Brit. India 5(2): 705. 1890.

L. resupinata var. *ridleyi* King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 37, t.49. 1898.

Plant epiphytic herb, 9-15 cm tall. Pseudobulb 1.6-2.8 × 0.6-0.9 cm, tufted, ovoid-cylindrical, sheathed. Leaves 2-4, 6-11 × 0.7-1 cm, alternate, membranous, linear-lanceolate, acute, sessile. Inflorescence laxly 10 to 35-flowered; peduncle 4-9 cm long, slender, zigzag, bracteolate; rachis 7-13 cm long; pedicellate-ovary 5-8 mm long. Flowers 4.5-7 mm long, yellowish-green; floral bracts lanceolate. Sepals subsimilar, 4-5 × 1.5-2 mm, oblong, obtuse; dorsal sepal retroflexed; lateral pair spreading, margins recurved. Petals 4.5-5 × 0.6-0.8 mm, linear, obtuse, spreading. Lip 2.5-3 mm long, broadly oblong to ovate, sagittate basically; apex obtuse, margins incurved; 2 calluses at base. Column 2-2.8 mm long, 2-winged. Pollinia 4.

Flowering : October – March; Fruiting: November – April.

Specimen cited : Lava forest 1900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0737**, dt. 16. 11. 2008.

Status : Frequent.

Local distribution : Damsang Gari, Algarah, Todey, Dabaipani, Chimney- Kurseong, Kafer, Pattabong, 1500–2100 m.

General distribution : India (Himalaya); Bhutan, China, Nepal.

Liparis resupinata var. *ridleyi* King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 37, t.49. 1898; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 237. 1979; Pearce & Cribb, Fl. Bhutan, 3(3): 209-210. 2002; Lucksom, Orch. Sikkim N.E. Himal. 290. t. 318, pl. 11. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* Life Sci. Leaf. 4: 25-26. 2013.

L. ridleyi Hook. f., Icon. Pl. ser. 3(19): t.1887; Fl. Brit. India 5(2): 705. 1890.

Plant epiphytic herb, 11-16 cm tall. Pseudobulb 2.7-6 × 0.7-1 cm, ovoid-cylindric, tufted, sheathed. Leaves 3-4, 4.5-8 × 0.7-1 cm, linear-lanceolate, acute, petiolate. Inflorescence 16-24 cm long, sub-erect, glabrous; peduncle 5.5-8 cm long; rachis 14.5-18 cm long, laxly many-flowered; pedicellate-ovary ribbed, glabrous, slender. Flowers 1.2-1.5 cm long, pale-green; floral bracts linear-lanceolate. Sepals sub-equal, oblong obtuse, translucent-green, glabrous, externally keeled; dorsal sepal 5.8-6.1 × 1.9-2.2 mm, externally, retroflexed; lateral pair 6-7 × 2-2.5 mm, translucent yellowish-green. Petals 5-5.8 × 0.5-0.6 mm, linear, obtuse, spreading, margin curved. Lip 4.8-5 × 2.3-2.9 mm, generally ovate, subacute, with saggitate base; apical lobe lie parallel to the column, tip margin of apical lobe incurved; 2 calluses at base. Column 3-3.2 mm long, winged. Anther ovate; pollinia obovate-clavate.

Flowering : October – February; Fruiting: November – March.

Specimen cited : Lava forest 1950 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0737**, dt. 02. 12. 2011.

Status : Sparse.

Local distribution : Algarah, Todey, Damsang forest, Rangayrung, Charkhol, 1600 – 2100 m.

General distribution : India (Sikkim, West Bengal).

Liparis somai Hayata, Icon. Pl. Formos. 4: 33, t.6. 1914; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Chowdhery, Orch. Fl. Arun. Pradh. 74. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 210. 2002; Lucksom, Orch. Sikkim N.E. Himal. 286. t. 309, pl. 10. 2007; Misra, Orch. India. 306. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* Life Sci. Leaf. 4: 26. 2013.

Cestichis somai Hayata, Icon. Pl. Formos. 4: 33. 1914.

Liparis sikkimensis Lucksom & S. Kumar, J. Indian Bot. Soc. 73: 159. 1994.

Plant epiphytic herb, 13-18 cm tall. Pseudobulb 3.1-4.2 × 1.9-2.5 cm, ovoid, smooth, sheathed. Leaves 2, 10-14 × 1.9-2.8 cm, apical, narrowly elliptic-oblong, mucronate, tapering towards base. Inflorescence erect, many-flowered; peduncle 3.6-5.9 cm long, winged; rachis 8-12 cm long; pedicellate-ovary 3.4-3.6 mm long. Flowers 4.7-5 mm long, creamy-white; floral bracts linear-lanceolate. Sepals subequal, spreading; dorsal sepal 2.3-2.8 × 0.5-0.6 mm, oblong, obtuse, revolute, reflexed; lateral pair 2.2-2.4 × 0.6-0.9 mm, ovate, subacute, revolute. Petals 1.9-2.2 × 1.4 mm, oblong, obtuse. Lip 1.7-2 × 1.5-1.9 mm, simple, narrowly oblong, obtuse, deflexed from the middle, ecallose. Column 1.5-1.6 mm long, terete, slightly curved. Anther 2-chambered; pollinia 4, ovate.

Flowering : September–November; Fruiting: October–December.
 Specimen cited : Sangsay Bhalukhop Busty 900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0969**, dt.07.10.2009.
 Status : Rare.
 Local distribution : Samalbong, Algarah forest, Rangayrung, Lungshel, 450 – 1100 m.
 General distribution : India (Sikkim); China and Japan.

Liparis viridiflora (Bl.) Lindl., Gen. Sp. Orchid. Pl.: 31. 1830; Hook. f., Fl. Brit. India 5: 704. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 53. 1926; Tuyama in Hara, Fl. E. Himal. 1: 443. 1966; Tuyama in Hara, Fl. E. Himal. 2: 191. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 235. 1979; Banerji, Orch. Nepal. 72. 1982; Hedge, Orch. Arun. Pradh. 41. 1984; Deva & Naithani, Orch. N.W. Himal. 299. t. 298. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 487-492. 1998; Bose *et al.* Orch. India. 315. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 211-212. 2002; Lucksom, Orch. Sikkim N.E. Himal. 285. t. 306, pl. 10. 2007; Misra, Orch. India. 306. 2007; Chowdhery & Agrawala, A Century W.H. Orch. 240. 2013; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* Life Sci. Leafl. 4: 26. 2013; Misra, Orch. Odisha. 264-265. 2014.

Malaxis viridiflora Bl., Bijdr.: 392. 1825.

Liparis longipes Lindl., Wall., Pl. Asiat. Rar. 1: 31, t.35. 1830.

Sturmia longipes (Lindl.) Rchb. f., Bonplandia 3: 250. 1855.

Liparis longipes var. *spathulata* (Lindl.) Ridl., J. Linn. Soc., Bot. 22: 294. 1886.

Leptorchis viridiflora (Bl.) Kuntze, Revis. Gen. Pl. 2: 671 1891.

L. longipes (Lindl.) Kuntze, loc. cit. 1891.

Cestichis longipes (Lindl.) Ames, Orchidaceae 1: 75. 1905.

Liparis pleistantha Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 4: 64. 1919.

Plant epiphytic herb, 16-34 cm tall. Pseudobulbs stem like, ovoid to long-cylindric. Leaves 2-3, 8-17 × 2-3 cm, obovate-oblong, obtuse, acute. Inflorescence cylindric,

slender, densely many-flowered; peduncle 4-10 cm long, glabrous; rachis 6-11 cm long; pedicellate-ovary 3-4 mm long. Flowers 4-5.5 mm across, pale-yellow; floral bracts lanceolate. Sepals similar, revolute, linear to oblong, free, obtuse, 1-nerved. Dorsal sepal 3-4.5 × 1-1.5 mm; lateral pair 3.5-4.2 × 1.2-2 mm, spreading. Petals 3.4-4 × 0.3-0.5 mm wide, linear, subacute, spreading to reflexed. Lip 2.8-3.5 × 2-2.5 mm across, recurved, broadly ovate, subacute, fleshy, ecallose. Column 1.5-1.7 mm long, incurved. Anther sub-orbicular; pollinia 4.

Flowering	: October – December; Fruiting: November – February.
Specimen cited	: Ramam forest 2000 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0944 , dt. 13. 10. 2009.
Status	: Sparse.
Local distribution	: Todey, Neora Valley, Damsang forest, Chimney-Kurseong, Sonada, 1200 – 2200 m.
General distribution	: India, (North East India, South India, Sikkim, West Bengal); Java and Sri Lanka.

Malaxis Soland. ex Sw.

Plants annual terrestrial herbs, occasionally mycotrophic and leafless. Stem modified into a leafy pseudobulb, fleshy. Leaf solitary to several, membranous to fleshy, plicate to conduplicate, sometimes petiolate. Inflorescence terminal, pedunculate, racemes to subumbel, laxly to densely many-flowered. Flowers small to minute, non-resupinate. Sepals free, subequal, spreading; lateral pair often connate at base. Petals filiform, coiled. Lip free from column, sessile, entire or lobed, basal auricles absent. Column short. Anther 2 chambered; pollinia 4.

The genus *Malaxis* Soland. ex Sw., comprises about 300 species distributed throughout the world but more frequently in South East Asia and the adjacent Islands.

Key to the species

1. Plant with 2 leaves..... *M. muscifera*
- 1a. Plant with more than 2 leaves..... *M. purpurea*

Malaxis muscifera (Lindl.) Kuntze, Revis. Gen. Pl. 2: 673. 1891; Tuyama in Hara, Fl. E. Himal. 1: 444. 1966; Tuyama in Hara, Fl. E. Himal. 2: 191. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 162. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 212. 1979; Banerji, Orch. Nepal. 74-75. 1982; Deva & Naithani, Orch. N.W. Himal. 309. t. 308. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 511. 1998; Bose *et al.* Orch.

India. 330. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 218 & 220, t. 219. 2002; Luckson, Orch. Sikkim N.E. Himal. 319-320. t. 332, pl. 11. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 13. 2012; *et* Life Sci. Leaflets. 9. 18 – 28. 2013.

Dienia muscifera Lindl., Wall. Cat.: 1935. 1829 *nom. nud.*; Gen. Sp. Orchid. Pl.: 23. 1830; Misra, Orch. India. 295. 2007.

Microstylis muscifera (Lindl.) Ridl., Journ. Linn. Soc. 24: 333. 1888; Hook. f., Fl. Brit. India 5: 689. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 20, t. 25. 1898; Bruhl, Guide Orch. Sikkim. 45. 1926.

Plant terrestrial herb, 11-37 cm tall. Pseudobulbs 1.4-2.4 × 1.3-2 cm tall, ovoid, sheathed. Stem 3-10 cm long. Leaves 2, 3.2-9.4 × 1.4-4.7 cm, ovate-oblong, obtuse, shortly petiolate, base sheathing. Inflorescence racemes, subdensely 31 to 85-flowered; peduncle 8-13 × 0.2-0.3 cm, ridged; rachis 3.8-14 cm long; pedicellate-ovary twisted. Flowers 3-5 mm long, yellowish-green; floral bracts lanceolate. Sepals subequal, 1.3-2 × 0.5-1 mm, oblong-lanceolate, subacute. Petals 1-2 × 0.2-0.3 mm, linear-lanceolate, acute. Lip 1.5-2 × 1-1.1 mm, superior, fleshy, broadly ovate; base slightly saccate; apex apiculate to mucronate, with 3 prominent ridges. Column 0.4-0.7 mm long, fleshy. Anther 2-chambered; pollinia 4.

Flowering : June – August; Fruiting: July – September.
Specimen cited : Gairibas forest 2800 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0633**, dt. 07. 08. 2008.
Status : Frequent.
Local distribution : Kalpokhari, Tiger Hill, Tonglu, Rachel, Bikhaybhanjang, Lamaydhura, Senchale, Sandakphu, Phalut, Jaunbari, Dhotray, Birch Hill, Gairibas, Gurasay, 2000 – 2900 m.
General distribution : India (Himachal Pradesh, Kashmir, Uttaranchal, Utter Pradesh, Sikkim, West Bengal); Bhutan, Nepal.

Malaxis purpurea (Lindl.) Kuntze, Revis. Gen. Pl. 2: 673. 1891; Hook. f., Fl. Brit. India 5: 857. 1890; Deva & Naithani, Orch. N.W. Himal. 309-311. t. 310. 1986; Pearce & Cribb, Fl. Bhutan, 3(3): 216-217. 2002; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; *et* Life Sci. Leaflets. 9. 18 – 28. 2013.

Microstylis purpurea Lindl., Gen. Sp. Orchid. Pl.: 20. 1830.

M. wallichii var. *biloba* (Lindl.) Hook. f., Fl. Brit. India 5(2): 686. 1888.

M. liparioides Schltr., Feddes Reper. Spec. Nov. Regni Veg. Beih. 4: 62. 1919.

Malaxis liparioides (Schltr.) Tang & Wang, Acta Phytotax. Sin. 1(1): 72. 1951.

Crepidium purpureum (Lindl.) Szlach., Fragm. Florist. Geobot. suppl. 3: 131. 1995; Misra, Orch. India. 290. 2007; Yonzon *et al.* McAllen Int. Orch. Soc. J., 13(4): 13. 2012; Misra, Orch. Odisha. 126-127. 2014.

Plant terrestrial herb, 17-36 cm tall. Stem glabrous. Leaves 3-5, 7-16 × 3-6.5 cm, elliptic-oblong, acute, petiolate. Inflorescence racemes, laxly many-flowered; peduncle 10-20 cm long, ribbed; rachis 8-15 cm long; pedicel and ovary 0.8-1 cm long. Flowers 8-1.2 mm long, yellowish-green; floral bracts reflexed. Dorsal sepal 5-7 × 2-3 mm, ovate-lanceolate, margins recurved; lateral pair 4.5-5.5 × 3-3.5 mm, broadly ovate-elliptic, subacute. Petals 5.5-6 × 0.9-1.2 mm, linear, obtuse, margins recurved. Lip 0.8-1 × 0.5-0.6 cm, narrowly ovate-sagittate; base divided into 2 falcate auricles; apex bent forward, divided into 2 parallel oblong lobules; disc base with depression. Column c. 1.5 mm long, fleshy. Anther 2 chambered; pollinia 4.

Flowering	: June – August; Fruiting: July – September.
Specimen cited	: Kumsi forest 700 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1678 , dt. 26. 07. 2011.
Status	: Sparse.
Local distribution	: Relli-Pala, Seokbir Khani, Tindharey, Pudung-Sendaybong, Rongo, Mangal dara, 700 – 800 m.
General distribution	: India (North India, North East India, Sikkim and West Bengal); Bhutan, Philippines, Sumatra, Thailand and Vietnam.

Crepidium Bl.

Plant terrestrial herb. Leaves plicate, convolute. Flowers non-resupinate. Lip sessile, concave in the centre, with a membrane surrounding the cavity; basal lip auricles large and long; gynostemium erect with two apical, finger-like projections. Column part slender. Anther dorsal, erect, movable, connectivity narrow, locules opening ventrally, rostellum foveolate, thin, erect, truncate, viscidium absent; pollinia 4.

The genus *Crepidium* Bl., comprises about 280 species distributed throughout the Asian tropics and subtropics, Australasia, and Indian Ocean Islands, with a few species in temperate Asia.

Key to the species

1. Inflorescence densely many flowers,..... *C. maximowicziana*
- 1a. Inflorescence with 4-13 flowers,2
2. Flowers 5-7 mm across. *C. khasiana*
- 2a. Flowers more than 1 cm across3

3. Sepals connate at base; lip ventricose,
base weakly saccate *C. josephianum*
3a. Sepals free; lip slightly convex, base 2-lobed *C. acuminatum*

Crepidium acuminatum (D. Don) Szlach., *Fragm. Florist. Geobot. suppl.* 3: 123. 1995; Lucksom, *Orch. Sikkim N.E. Himal.* 323. t. 338, pl. 12. 2007; Misra, *Orch. India.* 290. 2007; Yonzone *et al.* *McAllen Inter. Orch. Soc. J.*, 13(4): 13. 2012.

Malaxis acuminata D. Don, *Prodr. Fl. Nepal.*: 29. 1825; Hook. f., *Fl. Brit. India* 5: 857. 1890; Tuyama in Hara, *Fl. E. Himal.* 1: 443. 1966; Tuyama in Hara, *Fl. E. Himal.* 2: 191. 1971; Tuyama in Ohashi, *Fl. E. Himal.* 3: 161-162. 1975; Pradhan, *Indian Orch. Guide Identif. Cult.* 2: 210. 1979; Banerji, *Orch. Nepal.* 73-74. 1982; Deva & Naithani, *Orch. N.W. Himal.* 301 – 303. t. 300. 1986; Chowdhery, *Orch. Fl. Arun. Pradh.* 502. 1998; Bose *et al.* *Orch. India.* 327. 1999; Pearce & Cribb, *Fl. Bhutan*, 3(3): 213-214. 2002; M. Pradhan, *100 Sikkim Himal. Orch.* 56-57. 2005; Yonzone *et al.* *Int. J. Pharm. Life Sci.* 3(3): 1544. 2012; *et* McAllen *Int. Orch. Soc. J.* 14(2): 2-7. 2013; *et* *Life Sci. Leaflets.* 9. 18 – 28. 2013; Chowdhery & Agrawala, *A Century W.H. Orch.* 246. 2013.

Microstylis wallichii Lindl., *Gen. Sp. Orchid. Pl.*: 20. 1830; Hook. f., *Fl. Brit. India* 5: 686. 1890; King & Pantl., *Ann. Roy. Bot. Gard. (Calcutta)* 8: 16, t. 18. 1898; Bruhl, *Guide Orch. Sikkim.* 47. 1926.

M. biloba Lindl., *Wall. Cat.*: 1940.1. 1829; loc. cit. 1830.

Malaxis biloba (Lindl.) Ames, *Orchidaceae* 2: 112. 1908.

Microstylis trigonocardia Schltr., *Feddes Repert. Spec. Nov. Regni Veg. Beih.* 4: 62. 1919.

Malaxis acuminata var. *biloba* (Lindl.) Ames, *Enum. Philipp. Fl. Pl.* 18: 302. 1925; Hedge, *Orch. Arun. Pradh.* 42. 1984.

Malaxis wallichii (Lindl.) Deb, *Bull. Bot. Surv. India* 3: 128. 1962.

M. acuminata f. *biloba* (Lindl.) Tuyama, Hara, *Fl. E. Himal.*: 443. 1966.

M. allanii S.Y. Hu & Barrette, *Chung Chi J.* 13(2): 18, t. 9. 1976.

Plant terrestrial herb, 16-36 cm tall. Stem glabrous, sheathed. Leaves 3-4, 5.5-13 × 2.5-7 cm, ovate-lanceolate, acuminate, margins undulate, petiolate. Inflorescence racemes, laxly many-flowered; peduncle 12-27 cm long, ribbed; rachis 4.5-9 cm long; pedicellate-ovary 5-8 mm long. Flowers 1-1.3 cm long, yellowish-green; floral bracts minute. Sepals subsimilar, 5-6 mm long, free, oblong, margins recurved; dorsal sepal linear-oblong, subacute; lateral pair 5.5-6 × 1.6-1.8 mm, broadly oblong, obtuse. Petals 5-6 × 1-1.2 mm, linear, obtuse, margins recurved. Lip 6-7 × 4-5 mm, narrowly ovate-sagittate; base 2-lobed, inner margins separated, straight and parallel; apex flat, incurved at the notch. Column 1-1.1 mm long, fleshy. Anther ovate; pollinia 4.

Flowering : June – August; Fruiting: July – September.

Specimen cited : Kumsi forest 800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1664**, dt. 20. 07. 2011.

Status	: Sparse.
Local distribution	: Takdah, Lava, Dello Hill, Lopchu, Algarah, Birch Hill, Durpin, Tungsong, 600 – 2300 m.
General distribution	: India (North and North East India, Sikkim, West Bengal); Bhutan, China, Java, Malaysia, Myanmar, Nepal, Philippines, Thailand and Vietnam

Note: Intraspecific floral colour variation on *Crepidium acuminatum* (D. Don) Szlach. [Plate 4.2]

Morphologically both specimens look alike. Measurement of both the specimens are same distinct variation observed on the floral colour of the whole inflorescence. The normal floral colour is specimen B with yellowish-green colour but in the showing variation it was observed blakish red in specimen A. whole floral parts like dorsal sepal, lateral pair, petals, lip are colour variated except anther of column head. Even the colour of the pedicel is also darkish red in Specimen A. It seems that this is the first time that such observation has been made with comparative colour photograph.

It can not be categorized in new species, sub species, variety or forma but it is an intraspecific floral colour variation on the natural population of *Crepidium acuminatum* (D. Don) Szlach. In this case, it was concluded that it may be due to environmental effects on the plant species.

Crepidium josephianum (Rchb. f.) Hanna B. Margonska, comb. nov., Ann. Bot. Fen. 39: 63 – 66. 2002.

Malaxis josephiana (Rchb. f.) Kuntze, Revis. Gen. Pl. 2: 673. 1891.

Microstylis josephiana Rchb. f., Bot. Mag. 103: t.6325. 1877.

Plant terrestrial herb, 16-33 cm tall. Stem 3-6 cm long. Pseudobulbs 3-5 cm tall, fusiform, sheathed. Leaves 3-5, 5-12 × 4-7 cm, elliptic-lanceolate, acute, plicate, margins wavy, petiolate. Inflorescence racemes, laxly 5 to 11-flowered; peduncle 8-14 cm long; rachis 5-11 cm long; pedicel and ovary 4-8 mm long. Flowers 1.2-1.5 cm long, yellow-ochre, shaded with brown or yellow; floral bracts lanceolate, reflexed. Sepals 1-1.2 cm long, subsimilar, ovate, recurved, connate at base; dorsal sepal saccate at the base. Petals 0.8-1 cm long, linear-oblong, acute, recurved. Lip 0.8-1 × 0.7-0.9 cm, ventricose; base slightly saccate. Column c. 2 mm long. Anther ovate; pollinia 4.

Flowering	: May – June; Fruiting: June – August.
Specimen cited	: Kumsi forest 750 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1905 , dt. 26. 06. 2013.
Status	: Sparse.
Local distribution	: Kambal, Latpanjar, Mangaldara, Mungpoo, Neol forest, Nimbong, Samthar, 500 – 850 m.

General distribution : India (North East India, Sikkim).

Crepidium khasianum (Hook. f.) Szlach., *Fragm. Florist. Geobot. Suppl.* 3: 127. 1995; Lucksom, *Orch. Sikkim N.E. Himal.* 322. t. 336. 2007; Mishra, *Orch. India.* 290. 2007; Yonzon *et al.* *McAllen Int. Orch. Soc. J.*, 13(4): 13. 2012.

Malaxia khasiana (Hook. f.) Kuntze, *Revis. Gen. Pl.* 2: 673. 1891; Pradhan, *Indian Orch. Guide Identif. Cult.* 2: 210. 1979; Banerji, *Orch. Nepal.* 74. 1982; Chowdhery, *Orch. Fl. Arun. Pradh.* 504. 1998; Bose *et al.* *Orch. India.* 328. 1999; Pearce & Cribb, *Fl. Bhutan*, 3(3): 216. 2002; M. Pradhan, *100 Sikkim Himal. Orch.* 58-59. 2005; Yonzon *et al.* *Int. J. Pharm. Life Sci.* 3(3): 1545. 2012; *et Life Sci. Leaflets.* 9. 18 – 28. 2013.

Microstylis khasiana Hook. f., *Icon. Pl.*, ser.3(19) t.1831. 1889; Hook. f., *Fl. Brit. India* 5: 686. 1890; King & Pantl., *Ann. Roy. Bot. Gard. (Calcutta)* 8: 15, t. 17. 1898; Bruhl, *Guide Orch. Sikkim.* 46. 1926.

Plant terrestrial herb, 18-30 cm tall. Stem 4-7.5 cm long. Leaves 3-5, 4.5-10 × 2-3.6 cm, ovate-lanceolate, oblique, acute, margins wavy, petiolate. Inflorescence racemes; peduncle 6-8 cm long; rachis 10-15 cm long; pedicel and ovary 3-5 mm long. Flowers 5-7 mm across, greenish-purple; floral bracts lanceolate. Sepals subsimilar, broadly ovate, concave; dorsal sepal 3.5-4 × 1.5-2 mm, subacute; lateral pair 3.5-4 × 1.8-2.3 mm, obtuse. Petals 2.5-3 × 0.8-1 mm, linear, truncate. Lip 3-5.8 × 1.8-2 mm, yellowish-green, concave, with a central constriction; base 2-lobed, auriculate, falcate, acute, apices converging or overlapping; apex broad to oblong, margin erose, incurved. Column c. 1 mm long, oblong. Anther 2-locular; pollinia 4.

Flowering : July – August; Fruiting: August – September.

Specimen cited : Neora Valley 2500 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1663**, dt. 19. 07. 2011.

Status : Sparse.

Local distribution : Lava, Megma, Tonglu, Gairibas, Tangta, Senchale, 1000 – 3000 m.

General distribution : India (North East India, Sikkim); China, Thailand.

Crepidium maximowiczianum (King & Pantl.) Szlach., *Fragm. Florist. Geobot. Suppl.* 3: 129. 1995; Lucksom, *Orch. Sikkim N.E. Himal.* 324-325. t. 341. 2007; Misra, *Orch. India.* 290. 2007.

Malaxis maximowicziana (King & Pantl.) Tang & Wang, *Acta Phytotax. Sin.* 1: 72. 1951; Hook. f., *Fl. Brit. India* 5: 857. 1890; King & Pantl., *Ann. Roy. Bot. Gard. (Calcutta)* 8: 89. 1898; Pradhan, *Indian Orch. Guide Identif. Cult.* 2: 212. 1979; Bose *et al.* *Orch. India.* 330. 1999; Pearce & Cribb, *Fl. Bhutan*, 3(3): 216. 2002; Yonzon *et al.* *Int. J. Pharm. Life Sci.* 3(3): 1539. 2012; *et McAllen Int. Orch. Soc. J.*, 13(4): 9. 2012; *et Life Sci. Leaflets.* 9. 18 – 28. 2013.

Microstylis maximowicziana King & Pantl., *J. Asiat. Soc. Bengal* 64(3): 329. 1896; Bruhl, *Guide Orch. Sikkim.* 46. 1926.

Plant terrestrial herb, 30-45 cm tall. Stem 12-15 cm long, sheathed. Leaves 4 or 5, 12-15 × 5-6 cm, elliptic to ovate, slightly oblique, acute, petiolate, base sheathing. Inflorescence racemes, cylindric, densely many-flowered; peduncle 10-13 cm long, ridged; rachis 10-15 cm long; pedicel and ovary 4-5 mm long. Flowers 1.4-1.6 mm long, green; floral bracts linear-lanceolate. Sepals subsimilar; dorsal sepal 1.5-2 × 0.3-0.4 mm, oblong, obtuse, margins recurved; lateral pair 1.5-2 × 0.5-0.7 mm, slightly wider than the dorsal sepal. Petals 1.3-1.5 mm long, linear, obtuse, reflexed. Lip 1.2-1.5 mm long, hood-shaped; base 2-auriculate, slightly falcate, obtuse; apex crenulate, with 2 minute teeth. Column 1.2-1.5 mm long. Anther oblong-ovate; pollinia 4.

Flowering	: June – August; Fruiting: July – September.
Specimen cited	: Kumsi forest 750 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0481 , dt. 10. 06. 2008.
Status	: Common
Local distribution	: Yangmakum, Relli-Pala, Tindherey, Munsong, Mungpoo, Chisang-Godok, 600 – 1100 m.
General distribution	: India (Sikkim and West Bengal)

Dienia Lindl.

Plant terrestrial, rhizomatous. Stem modified into a leafy pseudobulb. Leaves 4-5, plicate, convolute, membranous, ovate-elliptic, acuminate, petiolate. Inflorescence terminal; peduncle with sheathing bracts; the raceme densely or sub densely many flowered. Flowers spreading, sepals and petals sub-equal, spreading. Lip 3-lobed, sub quadrate, clawed, with a perpendicular crest above the claw, thickened in the centre. Column slender, erect, with two short, twig – like apical appendages. Anther apical, sub erect; pollinia 4.

The genus *Dienia* Lindl., comprises about 19 species distributed throughout the Asian tropics and subtropics and in Australia.

Dienia ophrydis (Koen.) Ormer. & Seidenf., Lucksom, Orch. Sikkim N.E. Himal. 320. t. 333, pl. 12. 2007; Misra, Orch. India. 295. 2007; Yonzone *et al.* McAllen Int. Orch. Soc. J., 13(4): 13. 2012; Misra, Orch. Odisha. 122-123. 2014.

Malaxis ophrydis (Konig) Ormerod, Seidenf., Descrip. Epidend. Konig 1791: 18. 1995; Pearce & Cribb, Fl. Bhutan, 3(3): 220-221. 2002; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; *et* Life Sci. Leaflets. 9. 18 – 28. 2013.

Epidendrum ophrydis Konig, Retzius, Observ. Bot. 6: 46. 1791.

Malaxis latifolia J.E. Sm., Rees, Cycl.:22. 1822; Tuyama, Hara, Fl. E. Himal. 1: 444. 1966; Tuyama in Hara, Fl. E. Himal. 2: 191. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 208. 1979; Hedge, Orch. Arun. Pradh. 42. 1984; Deva & Naithani, Orch. N.W. Himal. 305. t. 306. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 504. 1998; Bose *et al.* Orch. India. 330. 1999.

Dienia congesta Lindl., Bot. Reg. 10: sub t.825. 1824.

Neottia plantaginea D. Don. Prodr. Fl. Nepal: 27. 1825.

Malaxis parvissima S.Y. Hu, Chung Chi J. 13(2): 22, t.10. 1976.

M. vietnamensis Ban & Huyen, Danh. Luc, Thuc Vat Tay Nguyen: 202. 1983.

M. latifolia var. *nana* S.S. Ying, Mem. Coll. Agric. Natl. Taiwan Univ. 25(2): 101. 1985.

M. shuicai S.S. Ying, J. Jap. Bot. 62(3): 70, t.1. 1987.

Microstylis congesta (Lindl.) Reichb. f., Walp., Ann. 6: 206. 1861; Hook. f., Fl. Brit. India 5: 689. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 19, t. 23. 1898; Bruhl, Guide Orch. Sikkim. 45. 1926.

Plant terrestrial herb, 28-41 cm tall. Pseudobulbs sheathed. Leaves 4-6, 6.5-17 × 2.5-8 cm, elliptic-lanceolate, acuminate, petiolate. Inflorescence racemes, erect, slender, densely many-flowered; peduncle 11-25 cm long; rachis 4-6 cm long; pedicel and ovary 2-3 mm long. Flowers 3-4 mm long, reddish-purple, purplish or yellow to yellowish-green; floral bracts linear. Sepals subsimilar, reflexed; dorsal sepal c. 3 mm long, oblong or elliptic, obtuse; lateral pair c. 3 mm long, oblique, ovate, obtuse. Petals 3-3.5 mm long, reflexed, linear-oblong. Lip 2.5-3 mm, fleshy, oblong, subquadrate; base extending to 2 triangular, obtuse, dentiform, side lobes and a central oblong-triangular to oblong apex; disc boat-shaped. Column 1-1.3 mm long, stout. Anther 2-chambered; pollinia 4.

Flowering : May – August; Fruiting: July – September.

Specimen cited : Pudung Busty 1000 m, **Rajendra Yonzone, D. Lama, and R. B. Bhujel 0525**, dt. 08. 09. 2009.

Status : Sparse.

Local distribution : Dello Hill, Kumsi, Nimbong, Lopchu, Bong Busty, 800 – 1600 m.

General distribution : Sri Lanka, India, China, South East Asia, the Ryukyu Islands, the Philippines, Malaysia, Indonesia, New Guinea and Australia.

Oberonia Lindl.

Plants perennial epiphytic herbs, erect to pendent. Stems usually clustered, leafy, short to elongate. Leaves coriaceous or fleshy, distichous, forming a fan or distributed along the stem, bilaterally compressed to terete, often jointed to a compressed leaf base. Inflorescence terminal, racemes or spike, densely many-flowered. Flowers minute, numerous, non-resupinate, spiral to verticillate. Sepals and petals spreading, free, subequal; petals smaller and narrower than the sepals. Lip sessile, shorter than the sepals, deflexed, entire or variously lobed, hypochile more or less concave. Column very short, fleshy; pollinia 4.

The genus *Oberonia* Lindl., comprises over 100 species distributed in Tropical Asia, extending to the Pacific Islands, Australia and with a single species in Madagascar and tropical Africa.

Key to the species

1. Leaves jointed2
- 1a. Leaves not jointed6
2. Flowers sessile; sunk in individual pits;
rachis fleshy *O. pachyrachis*
- 2a. Flowers pedicellate, not sunken in individual
pits; rachis not fleshy3
3. Plants with stems; leaves grass-like,
arranged along stem *O. caulescens*
- 3a. Plants stemless; leaves ensiform,
overlapping-flabellate at base4
4. Lip narrowed at middle5
- 4a. Lip not narrowed at middle *O. mucronata*
5. Lip with two cushion-like calluses
under the side lobes *O. ensiformis*
- 5a. Lip lacking cushion-like calluses under the side lobes *O. acaulis*
6. Plants with stems7
- 6a. Plants stemless8
7. Lip obscurely 3-lobed;
apex truncate to obscurely 2-lobed *O. angustifolia*
- 7a. Lip distinctly 3-lobed; apex distinctly 2-lobed *O. falcata*
8. Apical lobe of lip 2-lobed *O. recurva*

8a. Apical lobe of lip not 2-lobed *O. emarginata*

Oberonia acaulis Griff., Itin. Pl. Khasyah Mts.: 76. 1848; King & Pantl., Orch. Sikkim Himal. 89. 1898; Deva & Naithani, Orch. N.W. Himal. 312. t. 313. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 534. 1998; Bose *et al.* Orch. India. 343. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 222-223. 2002; M. Pradhan, 100 N.E. Indian Orch. 54-55. 2006; Lucksom, Orch. Sikkim N.E. Himal. 242. t. 256, pl. 9. 2007; Misra, Orch. India. 308. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; *et* Int. J. Res. Pharm. Life Sci. 1(1): 7-8. 2013.

Oberonia sikkimensis Lindl., Fol. Orchid. Oberonia 8: 4, no.22. 1859.

O. myriantha Lindl., op. cit. no.23. 1859; Hook. f., Fl. Brit. India 5: 679. 1888; Bruhl, Guide Orch. Sikkim. 42. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 198. 1979; Banerji, Orch. Nepal. 78. 1982.

Malaxis sikkimensis (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 212. 1861.

M. myriantha (Lindl.) Rchb. f., loc. cit. 1861.

Iridorchis myriantha (Lindl.) Kuntze, Revis. Gen. Pl. 2: 669. 1891.

Plant epiphytic herb, 23-40 cm tall. Stem short. Leaves 3-5, 8-22 × 0.8-1.3 cm, linear-ensiform, falcate, acuminate, unequal. Inflorescence verticillate, slender, decurved, densely many-flowered; peduncle 4-8 cm long, bracteate; rachis 17-33 cm long; pedicellate-ovary 1.5-2 mm long. Flowers 1.2-1.5 mm across, yellow; floral bracts minute, lanceolate. Sepals similar, 0.6-0.9 mm, ovate, entire, reflexed. Petals 0.8-1 mm long, oblong, entire, truncate, reflexd. Lip 1.8-2 × 1.1-1.3 mm, 3-lobed, warty, narrowed at middle; side lobes oblong, crenulate, obtuse; apical lobe large, divided into 2 lobules. Column c. 0.24 mm long, simple.

Flowering	: October – December; Fruiting: November – January.
Specimen cited	: Godok Busty 900 m, Rajendra Yonzon, D. Lama and R. B. Bhujel 1489 , dt. 05. 10. 2010.
Status	: Sparse.
Local distribution	: Todey, Tangta, Takdah, Toroyok, Rangayrung, Paiyung, 900 – 1900 m.
General distribution	: India (North India, Sikkim, West Bengal); Bhutan, China, Myanmar, Thailand, Vietnam.

Oberonia angustifolia Lindl., Fol. Orchid. Oberonia 8: 5, no.29. 1859; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bose *et al.* Orch. India. 343. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 227, t. 228. 2002; Lucksom, Orch. Sikkim N.E. Himal. 244. t. 261. 2007; Misra, Orch. India. 308. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; *et* Int. J. Res. Pharm. Life Sci. 1(1): 8. 2013.

Oberonia iridifolia var. *angustifolia* (Lindl.) Hook. f., Fl. Brit. India 5(2): 676. 1890.

Iridorchis angustifolia (Lindl.) Kuntze, Revis. Gen. Pl. 2: 669. 1891.

Oberonia denticulata subsp. *angustifolia* (Lindl.) Panigrahi & Dubey, Proc. 8th Ann.

Conf. Orissa Bot. Soc.: 2. 1983.

O. denticulata var. *angustifolia* (Lindl.) S. Misra, J. Orch. Soc. India 3(1-2): 70. 1989.

O. smisrae var. *angustifolia* (Lindl.) Panigrahi, Fl. Bilaspur Dist. 2: 593. 1999, syn. nov.

Plant epiphytic herb, 7-11 cm tall. Stem 2-4.8 cm long, leafy, sheathed. Leaves 4-6, 1.5-2.5 × 0.1-0.3 mm, conduplicate, linear-lanceolate, acute, base sheathing. Inflorescence erect, verticillate, many-flowered; peduncle 1-2 cm long; rachis 3.5-5.5 cm long; pedicellate-ovary 0.5-0.6 mm long. Flowers 0.4-0.5 mm long, green; floral bracts lanceolate. Sepals 0.5-0.54 × 0.3-0.4 mm, similar, ovate-elliptic, acute. Petals 0.4-0.5 × 0.25-0.3 mm, ovate, acute, margins erose. Lip 0.6-0.7 × 0.6-0.7 mm, obscurely 3-lobed; side lobes ovate, obtuse; apical lobe obscurely 2-lobed. Column 0.2-0.3 mm tall.

Flowering : June – July; Fruiting: July – August.

Specimen Cited : Sittong 1100 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0531**, dt. 26.06. 2008.

Status : Rare.

Local distribution : Lungshel, Dello Hill, Munsong, Lopchu, 800–1800 m.

General distribution : India (West Bengal and Meghalaya).

Oberonia caulescens Lindl., Fol. Orchid. Oberonia 2: 7, no.39. 1859; Hook. f., Fl. Brit. India 5: 682. 1888; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 11, t. 13B. 1898; Bruhl, Guide Orch. Sikkim. 39. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 196. 1979; Banerji, Orch. Nepal. 76. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 536. 1998; Bose *et al.* Orch. India. 345. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 223-224. 2002; Misra, Orch. India. 309. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1545. 2012; *et Int. J. Res. Pharm. Life Sci.* 1(1): 7-9. 2013.

Malaxis caulescens (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 215. 1861.

Iridorchis caulescens (Lindl.) Kuntze, Revis. Gen. Pl. 2: 669. 1891.

Oberonia longilabris King & Pantl., J. Asiat. Soc. Bengal 64(3): 330. 1896; Luckson, Orch. Sikkim N.E. Himal. 241. t. 254, pl. 6. 2007.

O. auriculata King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 13, t.16A. 1898.

O. yunnanensis Rolfe, J. Linn. Soc., Bot. 36: 6. 1903.

O. bilobatolabella Hayata, Icon. Pl. Formos. 4: 24. 1914.

O. pterorachis C.L. Tso, Sunyatsenia 1: 135. 1933.

Plant epiphytic herb. Stems 2.4-5 cm long. Leaves 4-5, 2-3 × 0.2-0.5 cm, linear-ensiform, acute, sessile. Inflorescence erect, subdense, verticillate towards base; peduncle 2-3 cm long, bracteate; rachis 0.9-1.1 mm long, slender, winged; pedicel and ovary 1-1.3 mm long. Flowers 2-3 mm long, reddish-brown to yellow; floral bracts lanceolate. Sepals 0.8-1 × 0.5 mm, similar, spreading, ovate, subacute, entire.

Petals c. 1 mm long, spreading, lanceolate, acute, entire. Lip 1-1.6 mm long, 3-lobed, slender; side lobes triangular-falcate, apices recurved; apical lobe deeply divided; lobules caudate-acuminate. Column 0.1-0.2 mm long, winged.

Flowering : June – September; Fruiting: July – October.
Specimen cited : Damsang forest 1900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1656**, dt. 18. 07. 2011.
Status : Rare
Local distribution : Lava, Sureil, Dhotrey, 1500 – 2700 m.
General distribution : India (Sikkim, West Bengal); Bengal and Nepal.

Oberonia emarginata King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 6, t.2A. 1898; Bruhl, Guide Orch. Sikkim. 41. 1926; Chowdhery, Orch. Fl. Arun. Pradh. 536-539. 1998; Bose *et al.* Orch. India. 345. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 229. 2002; Lucksom, Orch. Sikkim N.E. Himal. 245. t. 264, pl. 9. 2007; Misra, Orch. India. 309. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; *et* Pleione. 6(2): 397-400. 2012; *et* Int. J. Res. Pharm. Life Sci. 1(1): 9-10. 2013.

Oberonia micrantha King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 6, t.5. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 200. 1979.

Plant epiphytic herb, 4-9 cm tall. Stem short. Leaves 5-7, 1.5-3.7 × 0.2-0.3 cm, linear-ensiform, acute. Inflorescence 4.5-7 cm long, erect, verticillate, densely many-flowered; peduncle 1-1.7 cm long, bracteate; rachis 3.5-6 cm long; pedicellate-ovary 0.5-0.7 mm long. Flowers 0.7-1 mm across, pale-green; floral bracts minute. Sepals sub-equal, 0.5 × 0.4 mm, spreading, ovate, papillose externally; dorsal sepal entire, obtuse; lateral pair subacuminate. Petals 0.5 × 0.4 mm, ovate, obtuse or acuminate. Lip 0.6-0.7 × 0.5-0.7 mm, 3-lobed, antrorse; side lobes oblong, apex rounded; apical lobe semi-orbicular, margins entire to dentate. Column c. 0.3 mm long. Anther white; pollinia pale-yellow.

Flowering : June – September; Fruiting: July – October.
Specimen cited : Todey forest 1300 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0921**, dt. 08. 09. 2009.
Status : Sparse.
Local distribution : Dello Hill, Durpin-Kalimpong, Algarah, Takdah, Tungsong, 1000 – 2000 m.
General distribution : India (North East India, West Bengal); Bhutan and Thailand.

Oberonia ensiformis (J.E. Sm.) Lindl., Fol. Orchid. Oberonia 8: 4, no.21. 1859; Hook. f., Fl. Brit. India 5: 679. 1888; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 8, t. 9. 1898; Seidenf., Dansk Bot. Arkiv 33. (1): 13. 1978; Bruhl, Guide Orch.

Sikkim. 37. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 202. 1979; Banerji, Orch. Nepal. 77. 1982; Deva & Naithani, Orch. N.W. Himal. 312 – 315. t. 314. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 539. 1998; Bose *et al.* Orch. India. 346. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 224. 2002; Lucksom, Orch. Sikkim N.E. Himal. 242-243. t. 257. 2007; Misra, Orch. India. 309. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1545. 2012; *et Int. J. Res. Pharm. Life Sci.* 1(1): 10. 2013; Misra, Orch. Odisha. 244-245. 2014.

Malaxis ensiformis J.E. Sm., Rees, Cycl. 22: no.14. 1812.

Oberonia trilobata Griff., not. Pl. Asiat. 3: 273. 1851.

Iridorchis ensiformis (J.E. Sm.) Kuntze, Revis. Gen. Pl. 2: 669. 1891.

Plant epiphytic herb. Stem short. Leaves 4-5, 5.5-35 × 0.8-1.5 cm, linear-ensiform, falcate, acute, overlapping, flabellate at base. Inflorescence erect, subtruncate, densely many-flowered; peduncle 5-8 cm tall; rachis 6.5-14 cm long, fleshy; pedicel and ovary 0.8-1 mm long. Flowers 2-3 mm long, pale-brown; floral bracts ovate-orbicular. Sepals 1.2-1.5 mm long, subsimilar, ovate, subacute, entire, reflexed. Petals 1.2-1.5 mm long, ovate, subacute, hairy, margins entire, ciliate. Lip 2.1-2.5 × 1-1.5 mm, 3-lobed, setose; side lobes rounded, entire; apical lobe subquadrate, apex reniform, with lobules separated by an apical sinus; calluses 2. Column short. Pollinia pyriform.

Flowering : October–November; Fruiting: November–December.

Specimen cited : 27th Mile, Teesta N.H.P.C. Project side 550 m,
Rajendra Yonzone, D. Lama and R. B. Bhujel
1601, dt. 07. 10. 2011.

Status : Rare.

Local distribution : Najoke, Guling forest, Balasan, 450 – 700 m.

General distribution : India, Nepal, Thailand, Myanmar, China and Indo-China.

Oberonia falcata King & Pantl., J. Asiat. Soc. Bengal 64(3): 329. 1896; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 12, t. 14. 1898; Seidenf., Dansk Bot. Arkiv 33. (1): 30. 1978; Bruhl, Guide Orch. Sikkim. 37. 1926; Tuyama in Hara, Fl. E. Himal. 1: 445. 1966; Tuyama in Hara, Fl. E. Himal. 2: 191. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 162. 1975; Banerji, Orch. Nepal. 77. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 539. 1998; Bose *et al.* Orch. India. 346. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 229-230. 2002; Lucksom, Orch. Sikkim N.E. Himal. 244-245. t. 262, pl. 6. 2007; Misra, Orch. India. 309. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1545. 2012; *et Int. J. Res. Pharm. Life Sci.* 1(1): 10. 2013.

Oberonia pendula Ridl., J. Straits Branch Roy. Asiat. Soc. 61: 38. 1912.

Plant epiphytic herb. Stem 6-11 cm tall, leafy, sheathed. Leaves 5-6, 1.6-5.5 × 0.2-0.4 cm, linear-ensiform, falcate, base sheathing. Inflorescence erect, subverticillate,

densely many-flowered; peduncle 1-2 cm long; rachis 4-13 cm long; pedicel and ovary 1.3-1.5 mm long. Flowers 1.5-2 mm across, pale green to yellowish-green; floral bracts minute. Sepals c. 0.5 mm long, subsimilar, ovate-elliptic, acute, entire, reflexed to spreading. Petals c. 0.5 mm long, linear-oblong, obtuse, entire. Lip 1.3-1.5 mm long, 3-lobed; side lobes obtuse, forming small triangular projections; apical lobe 2-lobed. Column 0.2-0.4 mm long, winged. Anther ovate; pollinia ovate.

Flowering : July – October; Fruiting: August – November.
Specimen cited : Kafer Busty 1700 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1693**, dt. 19. 09. 2011.
Status : Rare.
Local distribution : Lava, Algarah, Dabaipani-Takdah, 1300 – 1800 m.
General distribution : India (North India); Nepal, Bhutan, Thailand, Vietnam and Malaysia.

Oberonia mucronata (D. Don) Ormer. & Seidenf., Seidenf., Contrib. Orch. Flora Thailand XIII: 20. 1997; Pradhan & Pradhan, 100 Beaut. Orch. 34. 1997; Pearce *et* Cribb, Fl. Bhutan, 3(3): 225-226. 2002; Lucksom, Orch. Sikkim N.E. Himal. 243-244. t. 260. 2007; Misra, Orch. India. 309. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; *et* Int. J. Res. Pharm. Life Sci. 1(1): 11. 2013; Misra, Orch. Odisha. 246-247. 2014.

Stelis mucronata D. Don, Prodr. Fl. Nepal: 32. 1825.

Cymbidium iridifolium Roxb., Hort. Bengal.: 63. 1814 *nom. nud.*: Fl. Ind. ed. 1832, 2(3): 458. 1832.

Oberonia iridifolia (Roxb.) Lindl. Wall. Cat. No. 1948. 1828; Deva & Naithani, Orch. N.W. Himal. 315 – 319. t. 318. 1986; Bose *et al.* Orch. India. 346. 1999.

Oberonia iridifolia Lindl., Gen. Sp. Orchid. Pl.: 15. 1830; Hook. f., Fl. Brit. India 5: 675. 1888; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 8, t.8. 1898; Seidenf., Dansk Bot. Arkiv 33. (1): 16. 1978; Chowdhery, Orch. Fl. Arun. Pradh. 543. 1998; Bruhl, Guide Orch. Sikkim. 42. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 205. 1979; Banerji, Orch. Nepal. 77. 1982.

O. denticulata Wight, Icon. Pl. Ind. Orient. 5: 1625. 1852.

Malaxis iridifolia (Roxb.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 208. 1861.

M. denticulata (Wight) Rchb. f., loc. cit. 1861.

Oberonia iridifolia var. *denticulata* (Wight) Hook. f., Fl. Brit. India 5(2): 676. 1890.

Iridorchis iridifolia (Roxb.) Kuntze, Revis. Gen. Pl. 2: 609. 1891.

Oberonia denticulata subsp. *iridifolia* (Roxb.) Panigrahi & Dubey, Proc. 8th Ann. Conf. Orissa Bot. Soc.: 2. 1983.

O. denticulata var. *iridifolia* (Roxb.) S. Misra, J. Orchid Soc. India 3(1-2): 69. 1989.

O. smisrae Panigrahi, Fl. Bilaspur Dist. 2: 591. 1999.

Plant epiphytic herb, 21-33 cm tall. Leaves 4-6, 4.5-23 × 1.5-2.5 cm, overlapping at base, fleshy, broadly ensiform, mucronate. Inflorescence decurved, densely many-flowered; peduncle 6-8.5 cm long, widely winged; rachis 16-24 cm long, slender, ridged; pedicellate-ovary 1-1.1 mm long. Flowers 1-1.3 mm long, sub-verticillate,

pale green; floral bracts elliptic. Sepals similar, 1 mm long, ovate, reflexed, overlapping the ovary, entire. Petals 0.8-1 mm long, ovate, reflexed, overlapping on the ovary, erose. Lip 1.2-1.5 × 0.6-1 mm, orbicular, slightly 3-lobed; side lobes pectinate, erose; apical lobe broad, transversely oblong, margins deeply fimbriate-erose to emarginate. Column very short. Anther two chambered; pollinia oblong.

Flowering : October–November; Fruiting: November–December.
Specimen cited : Kumai 600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0162**, dt. 25. 10. 2007.
Status : Common.
Local distribution : Relli, Kalijhora, Sittong, Pareng, Rongo, Gasoke, Rangit Valley, 300 – 900 m.
General distribution : India (North West Himalayas, Sikkim, West Bengal); Bangladesh, Bhutan, China, Indonesia, Malaysia, Nepal, Pacific – Island, Philippines.

Oberonia pachyrachis Rchb. f. ex Hook. f., Fl. Brit. India 5(2): 681. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 4, t. 3.. 1898; Seidenf., Dansk Bot. Arkiv 33. (1): 11. 1978; Bruhl, Guide Orch. Sikkim. 36. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Banerji, Orch. Nepal. 78. 1982; Deva & Naithani, Orch. N.W. Himal. 319. t. 321. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 547. 1998; Bose *et al.* Orch. India. 350. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 226. 2002; Lucksom, Orch. Sikkim N.E. Himal. 240. t. 250, pl. 8. 2007; Misra, Orch. India. 310. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; *et* Int. J. Res. Pharm. Life Sci. 1(1): 11. 2013.

Oberonia orbicularis Hook. f., Fl. Brit. India 5(2): 677. 1890.

Iridorchis orbicularis (Hook. f.) Kuntze, Revis. Gen. Pl. 2: 669. 1891.

I. pachyrachis (Rchb. f. ex Hook. f.) Kuntze, *loc. cit.* 1891.

Oberonia umbraticola Rolfe, Bull. Misc. Inform. Kew 1909: 62. 1909.

Plant epiphytic herb, 6-14 cm tall. Stem short, tufted. Leaves 2-3, 2.5-10 × 0.5-1.1 cm, ensiform, slightly falcate, tapering to base, acute. Inflorescence densely many-flowered, verticillate, stout; peduncle 0.5-0.9 cm long, compressed; rachis fleshy, erect; pedicellate ovary very short or sessile. Flowers 1-1.2 mm long, pale reddish-brown; floral bracts ovate-orbicular, serrate. Sepals similar, 0.5 × 0.24 mm, elliptic, obtuse, glandular at back, lying on surface of rachis. Petals 0.5 × 0.15 mm, linear-oblong, obtuse. Lip c. 0.5 × 0.25 mm, orbicular-elliptic, obtuse, concave, slightly erose at apex; base with a deep depression. Column 0.1-0.2 mm long, simple.

Flowering : October – January; Fruiting: November – February.
Specimen cited : Yangmakum Busty 600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0733**, dt. 14. 11. 2008.
Status : Common.

Local distribution : Kalijhora, Relli, Yangmakum forest, Najoke, Nimbong, Sittong, 300 – 800 m.
 General distribution : India, (North India, Sikkim, West Bengal); China, Myanmar and Nepal.

Oberonia recurva Lindl., Bot. Reg. 25: misc.14, no.8 1839; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Bose *et al.* Orch. India. 352. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 232. 2002; Misra, Orch. India. 310. 2007; Yonzone *et al.* Asian J. Pharm. Life. Sci., 1(4): 462. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1545. 2012; *et Int. J. Res. Pharm. Life Sci.* 1(1): 11. 2013.

Oberonia setifera Lindl., Fol. Orchid. Oberonia 8: 3, no.11. 1859.

Malaxis setifera (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 210. 1861.

M. recurva (Lindl.) Rchb. f., loc. cit. 212. 1861.

Iridorchis recurva (Lindl.) Kuntze, Revis. Gen. Pl. 2: 669. 1891.

Oberonia parvula King & Pantl., J. Asiat. Soc. Bengal 64(3): 330. 1896; Bruhl, Guide Orch. Sikkim. 40. 1926; Lucksom, Orch. Sikkim N.E. Himal. 248. t. 271, pl. 9. 2007.

O. croftiana King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 7, t.6A. 1898.

O. lingmalensis Blatt. & Mccann, J. Mobbay Nat. Hist. Soc. 35: 255. 1931.

O. myriantha var. *parvula* (King & Pantl.) Tang & Wang, Acta Phytotax. Sin. 1(1): 76. 1951.

Plant epiphytic herb, 3-7.5 cm tall. Leaves 3 or 4, 1-2.7 × 0.3-0.5 cm, ensiform-lanceolate, tapering to an acute tip, slightly falcate, overlapping at base. Inflorescence erect to decurved, densely many-flowered; peduncle 0.5-0.7 cm long, bracteate; rachis 2-2.7 cm long; pedicellate-ovary 1-1.1 mm long. Flowers 0.8-1 mm across, reddish-brown; floral bracts minute, elliptic. Sepals similar, 0.4-0.6 × 0.3-0.4 mm, ovate-cordate, entire, spreading. Petals 0.4-0.6 × 0.1-0.3 mm, oblong, obtuse, slightly crenulate to entire. Lip 0.7-1 × 0.5-0.6 mm, 3-lobed, oblong; base with a large depression; side lobes orbicular, erose-dentate; apical lobe with 2 incurved lobules. Column 0.1-0.2 mm tall.

Flowering : October – March; Fruiting: November – April.

Specimen cited : Gorubathan 400 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0221**, dt. 14. 03. 2008.

Status : Sparse.

Local distribution : Sevoke, Kalijhora, Relli, Gorubathan, Pareng, Panbu, Chuikhim, 200 – 900 m.

General distribution : India (Sikkim, West Bengal) Bhutan.

Tribe Calypsoeae Dressler

Cremastra Lindl.

Plants terrestrial. Pseudobulbs ovoid. Leaf solitary or 2, plicate, erect or suberect, subtended by a tubular sheath. Inflorescence racemes, second, lateral, erect, unbranched, laxly to densely few to many-flowered. Flowers resupinate, pendent, narrowly tubular. Sepals and petals similar, free, linear-spathulate, not spreading. Lip 3-lobed, free, slender; base slightly saccate, callose. Column elongate, slender, clavate; pollinia 4.

The genus *Cremastra* Lindl., comprises 2 species distributed in Nepal, North East India, Bhutan, Thailand, China, Taiwan and Japan.

Cremastra appendiculata (D. Don) Makino, Bot. Mag. (Tokyo): 24 1904; Deori & Das, Bull. Bot. Surv. India 18 (1-4): 235. 1976-1979; Tuyama in Hara, Fl. E. Himal. 1: 429. 1966; Tuyama in Hara, Fl. E. Himal. 2: 183. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 462. 1979; Banerji, Orch. Nepal. 102. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 246-248. 1998; Bose *et al.* Orch. India. 172. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 237, t. 236. 2002; Lucksom, Orch. Sikkim N.E. Himal. 326. t. 343, pl. 12. 2007; Misra, Orch. India. 290. 2007.

Cymbidium appendiculatum D. Don, Prodr. Fl. Nepal.: 36. 1826.

Cremastra wallichiana Lindl., Gen. Sp. Orchid. Pl.: 173. 1833; Hook. f., Fl. Brit. India 6: 16. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 182, t. 246. 1898; Bruhl, Guide Orch. Sikkim. 112. 1926.

Aplectrum appendiculatum (Bl.) f. Maekawa, Wild Orchids of Japan, Colour: 60. 1971.

Cremastra triloba Hayata, Icon. Pl. Formos. 2: 135. 1912.

C. appendiculata var. *triloba* (Hayata) Ying, Chinese Flowers: 4, t.3. 1976.

Plant terrestrial herb, stem 15-25 cm tall. Pseudobulbs 2-3.5 × 1-2.5 cm, oval, smooth. Leaf solitary or 2, 11-46 × 1.5-10 cm, apical, narrowly elliptic, plicate, acute, petiolate. Inflorescence 1, 5 to 22-flowered; peduncle 15-20 cm long; rachis 7-14 cm long; pedicel and ovary 3-5 mm long. Flowers 3-3.7 cm long, whitish-purple, drooping; floral bracts lanceolate. Sepals and petals similar, linear, widening at apex, connivent to form a tube at base; dorsal sepal 3-3.7 × 0.4-0.6 cm, oblanceolate, obtuse; lateral pair 3-3.7 × 0.3-0.6 cm, oblanceolate, subacute; petals 3-3.6 × 0.3-0.5 cm oblanceolate, obtuse. Lip 3-3.7 × 0.1-0.6 cm, 3-lobed, dilated, saccate at base; side lobes narrowly oblong, acute; apical lobe with 3 purple longitudinal strips, with a fleshy, granular appendage near base, disc with a median groove. Column with foot, 2.5-3 cm. Anther cap papillose; pollinia 4.

Flowering : April – May; Fruiting: May – July.

Specimen cited	: Tangta forest 2300 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1797 , dt. 11. 05. 2012.
Status	: Rare.
Local distribution	: Lava, Seri Khola, Manaybhanjang, Ramam, Gumbadara, 1800 – 2400 m.
General distribution	: Nepal, India, Bhutan, China, Taiwan and Japan.

Tipularia Nuttall

Plant terrestrial herb. Pseudobulbs small. Leaf solitary, plaited, petiolate. Inflorescence arising from base of pseudobulb, erect, slender, laxly racemes. Flowers small. Sepals and petals subequal, lanceolate, spreading. Lip long-spurred, curved forwards; side lobes rounded, each bearing a callus; apical lobe ovate-lanceolate, deflexed. Column broad, straight, wingless. Anther terminal, depressed; pollinia 4.

The genus *Tipularia* Nuttall, comprises 3 disjunct species found in North America, the Himalayas, China and Japan.

Tipularia josephi Rchb. f. ex Lindl., J. Proc. Linn. Soc., Bot. 1: 174. 1857; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 98. 1926; Tuyama in Hara, Fl. E. Himal. 1: 452. 1966; Tuyama in Hara, Fl. E. Himal. 2: 194. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 437. 1979; Bose *et al.* Orch. India. 449. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 244, t. 243. 2002; Lucksom, Orch. Sikkim N.E. Himal. 329-330. t. 348, pl. 12. 2007; Misra, Orch. India. 318. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1549. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 19. 2012.

Plant terrestrial herb, 23-40 cm tall. Pseudobulbs 1.4-1.8 × 1-1.3 cm, ovoid to subglobose, sheathed. Leaf solitary, 8-15 × 4.4-6 cm, broadly ovate, acute, margins undulate, plicate, petiolate. Inflorescence laxly 13 to 34-flowered, erect, arise from the base of the pseudobulb; peduncle 13-23 cm long; rachis 7-14 cm long; pedicellate-ovary 6-8 mm long. Flowers 0.8-1 cm wide, redish-dark green; floral bracts triangular. Sepals and petals similar, lanceolate, acute, spreading; dorsal sepal 6-6.5 × 1.6-2 mm; lateral pair 7-7.5 × 1-2 mm. Petals 7-7.4 × 1.5-2 mm, lanceolate. Lip 5-7 × 4-5 mm, 3-lobed, spurred; side lobes ovate, pointed, with a thick, oblong callus; apical lobe elliptic, acuminate, with an oblong callus at base; spur curved. Column 1-1.5 mm long, straight. Anther yellow; pollinia 4.

Flowering : June – August; Fruiting: July – September.

Specimen cited : Kalpokhari forest 3000 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0636**, dt. 08. 08. 2008.

Status	: Rare.
Local distribution	: Gairibas, Tonglu, Dhotrey, 1900 – 3100 m.
General distribution	: India (North East India, Sikkim); China, Myanmar and Nepal.

Tribe **Cymbidieae** Pfitz.

Subtribe **Eulophiinae** Benth.

Eulophia R. Br. *ex* Lindl.

Plants terrestrial herbs with fleshy tubers. Tubers several-noded. Leaves 2-many, appearing along with or after the flowers, thin, fleshy or coriaceous, lanceolate, ovate or elliptic; in mycotrophic species reduced to brownish scales. Inflorescence erect, lateral racemes or sometimes paniculate, laxly to subdensely many-flowered. Flowers often showy. Sepals and petals subequal, free to base (lateral pair sometimes fused to the column foot). Lip 3-lobed, spurred; usually with a callus on upper surface. Column with or without a foot, short to long, winged. Anther terminal, 2-celled; pollinia 2.

The genus *Eulophia* R. Br. *ex* Lindl., comprises about 250 species widespread in the tropical Americas, tropical and Southern Africa, Madagascar, the Mascarenes, tropical and subtropical Asia and Australasia.

Eulophia spectabilis (Dennst.) Suresh, *Regnum Veg.* 119: 300. 1988; Pearce & Cribb, *Fl. Bhutan*, 3(3): 253-254. 2002; Lucksom, *Orch. Sikkim N.E. Himal.* 352-353. t. 360, pl. 12. 2007; Misra, *Orch. India.* 299. 2007; Yonzon *et al.* *Int. J. Pharm. Life Sci.* 3(3): 1542. 2012; *et* McAllen *Int. Orch. Soc. J.*, 13(4): 10. 2012; Misra, *Orch. Odisha.* 184-185. 2014.

Wolfia spectabilis Dennstedr., *Schlüssel Hortus Malab.*: 11, 25, 38. 1818.

Eulophia nuda Lindl., *Gen. Sp. Orchid. Pl.*: 180. 1833; Hook. f., *Fl. Brit. India* 6: 5. 1890; King & Pantl., *Ann. Roy. Bot. Gard. (Calcutta)* 8: 180, t. 243. 1898; Pradhan, *Indian Orch. Guide Identif. Cult.* 2: 457. 1979; Hedge, *Orch. Arun. Pradh.* 56. 1984; Deva & Naithani, *Orch. N.W. Himal.* 383. t. 382. 1986; Bruhl, *Guide Orch. Sikkim.* 109. 1926; Chowdhery, *Orch. Fl. Arun. Pradh.* 393. 1998; Bose *et al.* *Orch. India.* 251. 1999.

Eulophia nuda var. *purpurea* Hook. f., *Ann. Roy. Bot. Gard. Calcutta* 5: 33. 1895.

Eulophia nuda var. *andersonii* Hook. f., *Ann. Roy. Bot. Gard. Calcutta* 5: 33. 1895.

Cyrtopera plicata Lindl., *op. cit.* 190. 1833.

Eulophia bicolor Dalzell, *Hooker's J. Bot. Kew Gard. Misc.* 3: 343. 1851.

Cyrtopera fusca Wight, *Icon. Pl. Ind. Orient.* 5: 1690. 1852.

C. mysorensis Lindl., J. Proc. Linn. Soc., Bot. 3: 32. 1859.
C. gardneri Thwaites, Enum. Pl. Zeyl.: 302. 1864.
C. laxiflora Gardner ex Thwaites, loc. cit. 1864.
Eulophia holochila Collett & Hensley, J. Linn. Soc., Bot. 28: 132. 1890.
Phaius steppicolus Handel-Mazzetti, Anz. Akad. Wiss. Wien. Math.-Naturwiss. Kl. 62: 253. 1925.

Plant terrestrial herb, 27-67 cm tall. Pseudobulbs 1.8-3 × 1.6-3 cm, subterranean, sheathed. Leaves 3 or 4, 9-20 × 2-4.7 cm, oblong-lanceolate, acuminate, plicate, petiolate. Inflorescence laxly 8 to 12-flowered; peduncle 18-28 cm long, sheathed; rachis 8-18 cm long; pedicellate-ovary 2.2-2.5 cm long, slender. Flowers 2.6-3 cm across, light green suffused with purple; floral bracts linear-lanceolate. Sepals subsimilar, spreading, acute to acuminate; dorsal sepal 1.5-2.4 × 0.4-0.6 cm, narrowly oblong-elliptic; lateral pair 2.2-2.5 × 0.6-0.7 cm obliquely oblong-elliptic, falcate, adnate to column foot. Petals 1.7-2 × 0.7-0.9 cm, ovate-elliptic, obtuse, reflexed at apex. Lip 1.8-2.3 × 1.2-1.5 cm, slightly 3-lobed, ovate-oblong, fleshy; side lobes slightly rounded; apical lobe obtuse, margin crenulate; spur conical, obtuse. Column 0.9-1 × 0.4-0.5 cm, narrowly winged below; foot long, curved. Anther dome shaped; pollinia ovate.

Flowering : May – July; Fruiting: June – September.
 Specimen cited : Kumsi forest 750 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0839**, dt. 01. 05. 2009.
 Status : Sparse.
 Local distribution : Sittong, Chisang-Godok, 600 – 1000 m.
 General distribution : India (Sikkim, West Bengal); Bhutan, China, Island, Indo-China, Malaysia, New Guinea, Philippines, Sri Lanka, Tunga.

Geodorum Jackson

Plant terrestrial herb. Pseudobulbs globose-subglobose, fleshy. Leaves terminal, elliptic, plicate. Inflorescence racemes, arising laterally from pseudobulb, crozier-like when flowering, erect in fruit, separate from the leaf bearing stem, densely several to many-flowered. Flowers crowded, not opening widely, campanulate. Sepals and petals similar, free. Lip sessile, entire to obscurely 3-lobed; base shortly saccate, not spurred, usually with an obscure, ridged callus. Column short, with foot; pollinia 2.

The genus *Geodorum* Jackson, comprises about 10 species, widespread from India, through South East Asia to Australia and the Islands of the South West Pacific.

Key to the species

1. Lip with distinct dark purple dichotomous to trichomous branching nerves on the lamina; without yellow calli on the claw.....*G. densiflorum*
- 1a. Lip pure white without any distinct dark purple dichotomous branching nerves on the lamina; 2 oval yellow calli on the claw..... *G. densiflorum* var. *kalimpongense*

Geodorum densiflorum (Lamk.) Schltr., Feddes Repert. Sp. Nov. Regni Veg. Beih. 4: 259. 1919; Pradhan, Indian Orch. Guide Identif. Cult. 2: 461. 1979; Banerji, Orch. Nepal. 106. 1982; Deva & Naithani, Orch. N.W. Himal. 393-395. t. 392. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 418-421. 1998; Bose *et al.* Orch. India. 263. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 255 & 257, t. 256. 2002; Lucksom, Orch. Sikkim N.E. Himal. 355. t. 364, pl. 13. 2007; Misra, Orch. India. 300. 2007; Yonzone *et al.* Int. J. of Pharm. Life Sci. 3(3): 1543. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 10. 2012; *et* 14(10): 4 – 20. 2013; Chowdhery & Agrawala, A Century W.H. Orch. 218. 2013; Misra, Orch. Odisha. 174-175. 2014.

Limodorum densiflorum Lamk., Encycl. 3: 516. 1792.

L. nutans Roxb., Pl. Coromandel 1: 33, t.40. 1795.

Malaxis cernua Willd., Sp. Pl., ed.4(1): 93. 1805.

M. nutans (Roxb.) Willd., *loc. cit.* 1805.

Cymbidium pictum R. Br., Prodr. 1: 331. 1810.

Geodorum purpureum R. Br., Aiton, Hortus Kew. ed.2(5): 207. 1813; Hook. f., Fl. Brit. India 6: 16. 1890; Bruhl, Guide Orch. Sikkim. 112. 1926; Hedge, Orch. Arun. Pradh. 57. 1984.

Otandra cernua (Willd.) Salisbury, Trans. Hort. Soc. 1: 298. 1812.

Geodorum pallidum D. Don, Prodr. Fl. Nepal. 31. 1825.

Cistella cernua (Willd.) Bl., Bijdr. 7: 293. 1825.

Geodorum pictum (R. Br.) Lindl., Gen. Sp. Orchid. Pl.: 175. 1833.

Ortmannia cernua (Willd.) Opiz, Flora 17: 592. 1834.

Geodorum fucatum Lindl., Bot. Reg. 20: t.1687. 1835.

G. semicristatum Lindl., Fol. Orchid. *Geodorum* 6: 2, no.7. 1854.

G. pacificum Rolfe, Inform. Bull. Misc. Inform. Kew 1908: 71. 1908.

G. neocaledonicum Kranz., Vierteljahrsschr. Naturf. Ges. Zurich 74: 82. 1929.

Plant terrestrial herb, 33-50 cm tall. Pseudobulb 2-4 × 3-3.6 cm, subglobose, sheathed. Leaves 3-4, 10-32 × 4-9 cm, fasciculate, plicate, oblong-elliptic, acuminate, petiolate. Inflorescence shorter than the leaves, subglobose, pendent, 10 to 15-flowered; peduncle 18-25 cm long, sheathed; rachis 3-5 cm long; pedicellate-ovary 0.8-1 cm long. Flowers 0.9-1.2 cm long, white to pale green with yellow and

purple nerved; floral bracts linear-lanceolate. Sepals and petals similar, linear-oblong to ovate-elliptic, acute to obtuse. Dorsal sepal 1-1.2 × 0.4-0.5 cm; lateral pair 1.2-1.4 × 0.4-0.5 cm. Petals 1.1-1.3 × 0.5-0.6 cm. Lip 1-1.3 × 0.8-1.1 cm, boat shaped; base slightly saccate; apical lobe obscurely 2-lobed, rounded lobed, margins slightly undulate; disc with 2 lamellae. Column 3-4 mm long, slightly curved, with a foot. Anther orbicular; pollinia 2.

- Flowering : May – July; Fruiting: June – September.
Specimen cited : Relli river sides below Bong Busty 500 m,
Rajendra Yonzone, D. Lama and R. B. Bhujel
0503, dt. 21. 06. 2008.
Status : Rare.
Local distribution : Bong Busty, Pudung, Sendaybong, Sittong,
300 – 1300 m.
General distribution : India (Sikkim, West Bengal), Malaysia,
Philippines, Ryukyu Islands the South East Asia,
Taiwan.

Geodorum densiflorum (Lamk.) Schltr. var. *kalimpongense* Rajendra Yonzone, D. Lama, R. B. Bhujel and Samuel Rai, McAllen Int. Orch. Soc. J.13(6) 5 – 10. 2012. [Plate 4.3; 4.4]

Geodorum densiflorum (Lamk.) Schltr. var. *kalimpongense* Rajendra Yonzone, D. Lama, R. B. Bhujel and Samue Rai, is distinct from *G. densiflorum* (Lamk.) Schltr. due to presence of pure white lip without any distinct dark purple dichotomous branching nerves on the lamina but with yellow invisible translucent nerves, 2 yellow longitudinal lamellae in between side lobes and apical lobe and 2 oval yellow calli on the claw. [Fig. 4.11]

Plant terrestrial herb, 32 cm tall. Tuber subglobular with 2-3 annular rings enclosed by scarious sheaths. Pseudostem 15 cm, 1.2 cm thick; Leaves 4, 15-32 × 6-9.5 cm. fasciculate, plicate, sub-erect, lanceolate-elliptic, acute to acuminate, petiolate. Inflorescence shorter than leaves, pendent, raceme, many-flowered, corymbose, peduncle erect, sheathed 24 cm long; rachis 3.5 cm long; with 10 to 16-flowered, floral bract linear-lanceolate, longer than the ovary. Flower 1.5 cm long, pure white; pedicellate ovary 0.8 × 0.2 cm. Sepals and petals sub-equal, white, linear oblong, ovate-elliptic, acute to obtuse 5-7-nerves, dorsal sepal 1.1-1.3 × 0.4 cm; lateral pair 1.2-1.4 × 0.4-0.5 cm across, petals 1.2-1.4 × 0.5-0.6 cm across. Lip 1.1-1.3 × 0.5-0.6 cm, white, without any distinct purple nerves, saccate at base; lamina without any distinct dichotomously or trichotomously branched purple coloured nerves, apical lobe slightly 2-lobed with rounded lobes, margins slightly undulate; disc with 2 distinct yellow longitudinal lamellae amidst of side and apical lobe, 2 globular yellow calli at the claw. Column 0.5 × 0.3 cm, slightly curved, white; anther white;

pollinia 2, yellow, ovoid. Fruit pendent 2.5-3.7 × 0.5-0.8 cm, green with persistent floral parts.

Flowering : June – July; Fruiting: June – September.
 Specimen cited : Kumsi 800 m, **Rajendra Yonzone, D. Lama, R. B. Bhujel and S. Rai 1213 A**, dt. 11. 06. 2010.
 Status : Rare.
 Local distribution : Suruk, Dello Hill, Seokbir khani, Lathpanjar, Peshok, 750 – 1300 m.
 General distribution : India (Sikkim, North East India, North West India); Bhutan, China, Japan, Myanmar, Nepal, Taiwan and Vietnam.

Ecology and Habitat: Terrestrial, growing on sandy loam to black soil (pH ranging from 3.6 to 4.6) at 930-1100 m altitude. In habitat, it preferably grows in barren field with *Imperata cylindrica* (L.) Reuschel.

Etymology: The varietal epithet *kalimpongense* of the *Geodorum densiflorum* is named after the Sub-Division of Kalimpong, from where the species was originally collected.

Typus: India, West Bengal, Darjeeling district, Kalimpong Sub-Division, , dt. 11. 06. 2010. Rajendra Yonzone D. Lama, R. B. Bhujel and Samuel Rai, (2010); (Holo 1213 A, CAL; Iso 1213 B, NBU; Iso 1213 C, CWC).

Distinguishing Characters

A details comparative account of fresh flowers is presented in Table 4.1.

Table 4.1: Comparative morphology of *Geodorum densiflorum* (Lamk.) Schltr. and new variety *kalimpongense* Rajendra Yonzone, D. Lama, R. B. Bhujel and Samuel Rai (2012).

Plant Character	<i>Geodorum densiflorum</i> (Lamk.) Schltr.	<i>Geodorum densiflorum</i> var. <i>kalimpongense</i> Rajendra Yonzone <i>et al.</i> 2012.
Plant height	33-50 cm tall.	32 cm tall.
Tuber	1.6-3.7 × 1.8-3.2 cm, globular to sub-globular with annular rings	2.3-3.6 × 3.1-3.5 cm sub-globular with 2-3 annular rings.
Leaf	3-4, 12-30 × 4.7-9.8 cm. 8-12-nerved	4, 15-32 × 6-9.5 cm, 10-12-nerved

Inflorescence	21-43 cm, 9-18 flowers, peduncle 18-41 cm, rachis 3-4 cm	25 cm long, 10-16 flowers, peduncle 21.5 cm, rachis c. 3.5 cm
Flower	1.1-1.6 cm across, white, with lip shaded with light purple to dark purple nerves and 2 longitudinal lamellae on the middle of side lobes and apical lobe. Column 0.6 × 0.3 cm, white. Anther 2 × 2.1 mm, orbicular; pollinia 2, yellow, ovoid.	1.3-1.5 cm across, white, less scented with pure white with yellow translucent veins on the lamina. 2 yellow lamellae in between side lobes and apical lobe. Column 0.5 × 0.3 cm, white anther 1.9 × 2 mm; pollinia 2, yellow.
Dorsal Sepal	1-1.5 × 0.3-0.5 cm, 3- nerved, white to purple, dorsal sepal-lateral pair 2.1 cm across	1.1-1.3 × 0.4 cm. dorsal sepal-lip-1.1 cm, dorsal sepal-lateral sepal -1.3 cm. across, 3-nerved.
Lateral pair (sepals)	1.1-1.4 × 0.3-0.6 cm, slightly 5-nerved, dorsally keeled, white to purple.	1.2-1.4 × 0.4 cm. lateral sepal - lateral sepal -1.6 cm across. 3-nerved.
Petals	1-1.5 × 0.4-0.7 cm, ovate-oblong, obtuse, 3-nerved, dorsally keeled, white to purple.	1.2 × 0.5cm. 5-nerved. Petal-petal 1.4 cm across.
Lip	1-1.4 × 0.6-0.8 cm long, ventricose at the base, much thickened, apical lobe broad and distinctly 2-lobulate, 2 dull purple lamellae emerge from the basal disc and bifurcate towards the base apical lobe to give 2 distinct yellow granulated longitudinal lamellae. (in between side and apical lobes. Apical lobe with distinctly dichotomous and sometimes trichotomous nerves. Dark purple coloured distinct nerves emerge from the base of the disc towards the side lobes. Presence of dark purple blotch on the apical lobe just above 2 yellow elongated lamellae. Sides of apical lobe crenate.	1.1-1.3 × 0.5-0.6 cm, 1.1 when expanded, saccate at base, white, lamina slightly 3-lobed, side lobes crenate, apical lobe oblong-ovate, tip slightly, bifurcate, 2 yellow, globular calli at claw. Lamina without any distinct dichotomous or trichotomous branched purple coloured nerves, 2 yellow longitudinal lamellae (0.6 cm) present in between side lobes and apical lobe.

Enumeration of seven intraspecific floral morphology and colour variation observed specimens of *Geodorum densiflorum* (Lamk.) Schltr. [Plate 4.5]

1. Plant 28-33 cm tall; stem 10 cm long and 0.8 cm thick. Tuber subglobose, new tuber 1.7 × 1.8 cm; old tuber 2.5 × 2.3 cm; covered by sheath. Leaves 3, 16-30 × 5.7-7.2 cm, suberect, lanceolate, oblong-elliptic, tip acuminate, petiolate. Inflorescence 26 cm tall; peduncle 21-23 cm, sheathed, erect; rachis 3-3.5 cm long, drooping downward; 9-13-flowered. Flowers white, 1.1-1.3 cm long. Sepals and petals subequal, elliptic-obovate, apex obtuse, externally keeled. Dorsal sepal 0.9 × 0.3 cm, oblanceolate-oblong to ovate-elliptic; lateral pair 0.9 × 0.3 cm. Petals 1 × 0.5 cm. Lip 1.1-1.3 × 0.9-1 cm, light pale to pink colour, distinct yellow patch on the disc and no visible nerves on the lamina; epichile 2-lobed, crenate. Column c. 4.5 × 3.5 mm.
 - 1a. Flowers white. Sepals and petals subequal, elliptic-obovate, apex obtuse, externally keeled. Lip 1.1-1.3 × 0.9-1 cm, light pale to pink colour, distinct yellow patch on the disc and distinct yellow visible nerves on the lamina.
2. Plant 26 cm tall; stem 13 cm long and 0.8 cm thick. Tuber subglobose, new tuber 1.7 × 2 cm; old tuber 3.7 × 3.2 cm. Leaves 3, 15-38 × 5-7.5 cm, plicate, elliptic, acute to acuminate. Inflorescence 23 cm tall, peduncle erect, rachis 5.5 cm drooping downward; 11 – 16-flowered. Flowers whitish pink, 1.2-1.4 cm long; pedicellate ovary 1 × 0.2 cm. Sepals subequal, elliptic-obovate; dorsal sepal 1.5-0.5 cm; lateral pair 1.5 × 0.7 cm. Petals 1.4 × 0.6 cm, oblong-ovate, externally keeled. Lip 1.4 × 0.8 cm, saccate, epichile 2-lobed, grey colour, distinct pink nerves on the lamina with 2 united yellow lamellae at the centre; epichile scattered dark pink colour, margin crenate. All floral parts whitish pink colour with pink dotted on the inner apical parts. Column white.
3. Plant 31-37 cm tall; stem 9 cm long and 1.2-1.5 cm thick. New tuber 1.8 × 2 cm, old tuber 3.5 × 2.7 cm. Leaves 4, fasciculate, 14-29 × 6.4-7.8 cm, plicate, suberect, elliptic, acuminate, lower leaf shortest and broadest, leaf margin wavy. Inflorescence 2 per plant, 23 cm tall, peduncle 19 cm erect and rachis 4 cm, drooping, 12-15-flowered, 4 enveloping sheaths. Flower 1.8-2.3 cm long, pinkish purple, showy, pedicellate ovary 0.6-0.9 × 0.2-0.25 cm. Apical portion of floral parts light pink and the basal parts dark pink. Sepals subequal, elliptic-obovate; dorsal sepal 1.2 × 0.4 cm; lateral pair 1.3 × 0.5 cm, externally keeled. Petals 1.2 × 0.6 cm, oblong-ovate, obtuse, externally keeled. Lip 1.3 × 0.7 cm, 3-lobed, nerves on the lamina are visible, whitish yellow lamellae on the disc, grey mark at the claw; epichile 2-lobed, faintly deflexed. Column c. 4.8 × 3.7 mm.
4. Plant 29 cm tall; stem 15 cm long and 1.2 cm thick. Leaves 4, 15-32 × 6-9.5 cm, unequal, elliptic, 10-12-nerved, tip acute, margin wavy. Inflorescence 24

cm tall; peduncle erect, rachis 3.5 cm long, drooping, 10-15-flowered. Flower pure white, 1.1-1.4 cm long; pedicellate ovary 0.8-1.1 × 0.2-0.3 cm. Sepals subequal, not fully opened, elliptic-ovate; dorsal sepal 1.1-1.3 × 0.4 cm; lateral pair 1.2-1.4 × 0.4 cm. Petals 1.2 × 0.6 cm, oblong-ovate, obtuse, externally keeled. Lip 1.2 × 0.6 cm, 3-lobed, pure white, two distinct yellow lamellae on the disc of lamina, without nerves on lamina; epichile slightly 2-lobed, crenate, 2 yellow oval calli at claw. Column c. 0.5 × 0.3 cm.

5. Plant 28 cm tall; stem 9-10 cm long and 1.2 cm thick. New tuber 2 × 1.8 cm, old tuber 4, 2.3-3.5 × 2.2-3.6 cm, 13-15 roots, Leaves 3-4, unequal, suberect, plicate, acute, acute, petiolate base. Inflorescence 2, 28-30 cm tall, peduncle erect, rachis 4.5 cm, drooping. Flowers showy, 1.1-1.3 cm long; pure pinkish-purple, fragrant, faintly falcate, green, acute. Apical portion of floral parts are light pink and basal portion dark pink, externally keeled. Sepals subequal, not fully opened, elliptic-obovate; dorsal sepal 1.2 × 0.5 cm; lateral pair 1.2 × 0.5 cm. Petals 1.4 × 0.6-0.7 cm, oblong-ovate, obtuse. Lip 1.2 × 0.6 cm, 3-lobed, nerves on the lamina are distinct; epichile crenate and distinctly 2-lobed. Column c. 0.5 × 0.4 cm.
6. Plant 30 cm tall; stem 10 cm long and 1 cm thick. Leaves 3-4, 14-36 × 5.8-11 cm, suberect, unequal, elliptic, acute, nerved. Old tuber 3.6 × 3.5 cm with 9-10 white fleshy roots. Inflorescence 2 per plant, 15-22 cm tall, peduncle 11-17 cm erect, rachis 4-5 cm, drooping; 10-22-flowered. Flowers showy, 1.3-1.6 cm long, white; pedicellate ovary 0.8 × 0.2 cm. Sepals subequal, elliptic-obovate; dorsal sepal 1.3 × 0.4 cm; lateral pair 1.2 × 0.5 cm. Petals 1.4 × 0.7 cm, oblong-ovate, obtuse, externally keeled. Lip 1.3-1.6 × 0.7 cm, broad, yellow bulging lamellae on the disc, nerves on the lamina are distinctly visible, epichile distinctly 2-lobed, faintly deflexed outward. Column c. 0.5 × 0.4 cm, white.
7. Plant 34 cm tall; stem 15 cm long, 1.3 cm thick. New tuber 3 × 3.5 cm thick, old tubers 3-4 × 3.4-4 cm thick. Leaves 4, 15-38 × 7.5-13 cm, unequal, plicate, elliptic, acute, petiolate. Inflorescence 2, 18-23 cm tall, peduncle erect, rachis 4 cm, drooping, 17-24-flowered. Flower showy, 1.3-1.6 cm long, white, fragrant; pedicellate ovary 0.8-1.1 cm. Sepals subequal, elliptic-obovate; dorsal sepal 1.5 × 0.6 cm; lateral pair 1.5 × 0.6 cm, faintly falcate, externally keeled. Petals 1.6 × 0.8 cm, oblong-ovate, obtuse or subacute, externally keeled. Lip saccate, faintly 3-lobed, 1.6 × 0.9-1 cm, whitish-yellow lamellae weakly visible with pink spots on the disc, obscurely visible light pink nerves on the lamina, grey marks at claw; epichile margin crenate, apical 2-lobed, deflex outward. Column c. 0.5 cm, white.

The flower morphology and colour variation has been observed in the seven specimens of *Geodorum densiflorum* (Lamk.) Schltr. It is clear that the species

studied varies distinctly in floral morphology and flower colour especially on lip. Purple flowers colour of no. 3 and 5 are more or less alike but the colour of other flower no. 1, 2, 4, 6 and 7 are white. Similarly, the colour variation and structure of lip of mature and immature flowers of different sample are critically observed and compared in the field and found distinguish variation. Such variation is also possible by means of intraspecific natural hybridization also.

Subtribe **Cyrtopodiinae** Benth.

Cymbidium Sw.

Plants perennial epiphytic or terrestrial herbs, rarely saprophytic. Pseudobulbs short to elongate, sheathed. Leaves long, narrow, oblong or rarely lanceolate, coriaceous. Inflorescence erect or curved, suberect or pendent, racemes, 1 to many flowered; peduncle sheathed. Flowers often large and showy. Sepals and petals subequal, free, spreading. Lip 3-lobed, sessile, adnate to the base of the column and embracing it more or less by its convolute side lobes; apical lobe decurved, often with undulate edges, disc usually with two ridges or lamellae. Column long, without foot. Anther solitary or imperfectly 2-celled; pollinia 2.

The genus *Cymbidium* Sw., comprises about 50 species distributed in India, East through South East Asia, China, Japan, Indonesia to Australia.

Key to the species

1. Lip free, attached to the base of the column or rarely to a short columnar foot2
- 1a. Lip fused at the base to the base of the column.....6
2. Pollinia 4; lip with callus-keels converging at the apex forming a short tube *C. lancifolium*
- 2a. Pollinia 2; lip callus-keels not converging at the apex3
3. Leaves elliptic, petiolate *C. devonianum*
- 3a. Leaves ligulate to linear-oblong, without distinct petiole.....4
4. Leaves thick, obtuse to emarginated and unequally 2-lobed at tip; callus-ridges broken.....5
- 4a. Leaves thinner, acute to acuminate at the tip with

- slightly oblique apex; callus-ridges entire, not broken ... *C. dayanum*
5. Side lobes of lip longer than the column and
anther cap, nerved with maroon..... *C. aloifolium*
- 5a. Side lobes of lip shorter than the column and anther
cap, finely mottled with maroon or purple-brown *C. bicolor*
6. Callus composed of single, wedge-shaped ridge.....*C. eburneum*
- 6a. Callus with two parallel ridges7
7. Flowers pendulous, campanulate; anther cap with
distinct, backward pointing beak; pollinia clavate8
- 7a. Flowers erect, not campanulate; anther cap without
a distinct beak; pollinia either triangular or quadrangular9
8. Flowers yellowish, with a creamy or pale-green lip,
occasionally with sparse pink spots;
apical lobe strap-shaped..... *C. longifolium*
- 8a. Flowers greenish-brown, with yellowish lip,
covered with numerous red-brown spots;
apical-lobe cordate to suborbicular..... *C. cochleare*
9. Leaves finely forked at tip; scapes
produced from the axils of leaves; *C. mastersii*
- 9a. Leaf-tip acute; scapes produced from
near the base of pseudobulbs10
10. Flowers more than 5 cm across11
- 10a. Flowers less than 5 cm across..... *C. erythraeum*
11. Apical lobe of lip V-shaped, not papillose *C. lowianum*
- 11a. Apical lobe of lip not V-shaped, papillose 12
12. Leaves upto 2.5-5 cm broad, sepals and petals
marked with red-brown *C. iridiodes*
- 12a. Leaves upto 2-2.8 cm broad;
sepals and petals clear green *C. hookerianum*

Cymbidium aloifolium (L.) Sw., Nova Acta Regiae Soc. Sci. Upsal. 6: 73. 1799; Hook. f., Fl. Brit. India 6: 10. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 189, t. 252. 1898; Bruhl, Guide Orch. Sikkim. 115. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 475. 1979; Deva & Naithani, Orch. N.W. Himal. 356-358. t. 357. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 253. 1998; Bose *et al.* Orch. India. 176. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 259-260. 2002; Lucksom, Orch.

Sikkim N.E. Himal. 368-369. t. 381, pl. 13. 2007; Misra, Orch. India. 290. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012; *et* McAllen Int. Orch. Soc. J.13(7): 5. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 128. 2013; Misra, Orch. Odisha. 268-269. 2014.

Epidendrum aloifolium L., Sp. Pl. ed. 1: 953. 1753.

C. simulans Rolfe, Orch. Rev. 25: 175. 1917; Banerji, Orch. Nepal. 105. 1982.

Plant epiphytic herb, 40-73 cm tall. Pseudobulbs 6-8 × 3-4 cm, ovoid, bilaterally flattened, sheathed. Leaves 4-5, 33-59 × 2.6-3.5 cm, oblong, obtuse to emarginated, tip unequally 2-lobed, coriaceous, arching. Inflorescence 10 to 20-flowered; peduncle 4-11 cm long; rachis 24-67 cm long; pedicellate-ovary 1.8-2.4 cm long. Flowers 3.5-4.2 cm across, yellowish-purple; floral bracts lanceolate. Sepals similar, 2-2.4 × 0.6-0.7 cm, mucronate, erect, oblong, obtuse. Petals 1.8-2.3 × 0.5-0.8 cm, mucronate, porrect, elliptic, obtuse to acute. Lip 1.7-2.2 × 1.1-1.4 cm, 3-lobed, yellow with dark-purple bands, saccate at base; side lobes obtuse, clasping the column; apical lobe ovate, obtuse, mucronate, decurved; disc 2 lamellae. Column 1.1-1.3 cm long, curved, winged; foot short. Anther sub-quadrate; pollinia 2.

Flowering : April – July; Fruiting: June – August.

Specimen cited : Relli forest below Bong Busty 700 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0362**, dt. 11. 05. 2008.

Status : Sparse.

Local distribution : Suruk, Birik, Kalimpong 7th Mile, Chitrey-Teesta, Sangsay Bhalukhop, Seokbir khani, Tindharey, Durpin-Kalimpong, Pankhabari, Echey Busty, 300 – 1600 m.

General distribution : India, Nepal, South China, Myanmar, Thailand, South East Asia, Malaysia and Java.

Cymbidium bicolor Lindl., Gen. Sp. Orchid. Pl.: 164. 1833; Hook. f., Fl. Brit. India 6: 11. 1890; Deva & Naithani, Orch. N.W. Himal. 358. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 253. 1998; Bose *et al.* Orch. India. 178. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 260. 2002; Misra, Orch. India. 290. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* McAllen Int. Orch. Soc. J.13(7): 16. 2012; Misra, Orch. Odisha. 270-271. 2014.

subsp. *obtusum* Du Puy & P.J. Cribb, Genus *Cymbidium*: 70. 1988.

Cymbidium crassifolium Lindl., Gen. Sp. Orchid. Pl.: 165. 1833.

C. mannii Rchb. f., Flora 55: 274. 1872.

C. pendulum sensu King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 188, t.251. 1898; Bruhl, Guide Orch. Sikkim. 116. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 475. 1979.

C. flaccidum Schltr., Feddes Repert. Spec. Nov. Regni Veg. 12: 109. 1913.

Plant epiphytic herb, 24-61 cm tall. Pseudobulbs narrowly ovoid, sheathed. Leaves 5-7, 32-72 × 2.4-3.9 cm, linear-oblong, obtuse, arching. Inflorescence pendent, 10 to 21-flowered; peduncle 2-12 cm long; rachis 8-33 cm long; pedicellate-ovary 2-2.6 cm long. Flowers 2.5-4.5 cm across, purple-brown; floral bracts triangular, shorter than the ovary. Sepals similar, 1.8-2.2 × 0.5-0.7 cm, erect, spreading, narrowly oblong, subacute. Petals 1.7-2 × 0.5-0.7 cm, spreading, narrowly oblong-elliptic. Lip 1.6-1.8 × 0.9-1.5 cm, 3-lobed, creamy-white with purple streaks, saccate at base; side lobes erect, obtuse, porrect to recurved; apical lobe elliptic, rounded, emarginate; disc with 2 lamellae. Column 1-1.2 cm long, curved, winged at apex; foot short. Anther depressed; pollinia 2.

Flowering	: April – May; Fruiting: May – August.
Specimen cited	: Samalbong Busty 700 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0816 , dt. 17. 04. 2009.
Status	: Sparse.
Local distribution	: Sinjee, Primtam, Suruk, Dudhey, Relli-Pala, Chitrey-Teesta, 300 – 1100 m.
General distribution	: India (North East India, Sikkim, West Bengal); Myanmar.

Cymbidium cochleare Lindl., J. Proc. Linn. Soc., Bot. 3: 28. 1859; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 194, t. 260. 1898; Bruhl, Guide Orch. Sikkim. 118. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 479. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 57. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 256. 1998; Bose *et al.* Orch. India. 178. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 265. 2002; Lucksom, Orch. Sikkim N.E. Himal. 375. t. 392, pl. 14. 2007; Misra, Orch. India. 290. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012 *et* McAllen Int. Orch. Soc. J.13(7): 6. 2012.

Cyperorchis cochlearis (Lindl.) Benth., J. Linn. Soc., Bot. 18: 318. 1881; Hook. f., Fl. Brit. India 6: 15. 1890.

Plant epiphytic herb, 32-63 cm tall. Pseudobulbs 6-7 × 2.5 cm, small, narrowly ovoid. Leaves 9-13, 57-92 × 1.1-1.3 cm, distichous, linear, tip acute. Inflorescence 8 to 16-flowered; peduncle 25-35 cm long, arching; rachis slender, pendent; pedicellate-ovary 1.6-2.2 cm long. Flowers 2.4-2.7 cm long, campanulate, greenish-brown, drooping; floral bracts scarious. Sepals and petals greenish-brown. Sepals similar, 4.5-4.9 × 0.9-1.1 cm, narrowly obovate, acute; dorsal sepal porrect; lateral pair oblanceolate, mucronate. Petals 4.4-4.8 × 0.6-0.8 cm, narrowly oblong-obovate, subacute, slightly falcate, porrect. Lip 4.2-4.6 × 1.1-1.3 cm, 3-lobed, yellow with reddish-brown spotted, slender, elongate, deltoid, adnate to column base; side lobes subacute, erect, glabrous; apical lobe suborbicular, mucronate, porrect, margin undulate; disc 2-ridged, puberulent, the sides united, shell-shaped towards apex. Column 3.4-3.8 cm long, slender, deflexed at apex. Anther beaked; pollinia 2.

Flowering : October – December; Fruiting: November – January.
 Specimen cited : Charkhol forest 1600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1011**, dt. 04. 11. 2009.
 Status : Sparse.
 Local distribution : Takdah, Lava, Algarah, Dabaipani, Dali-Darjeeling, Rambi forest, 1500 – 2200 m.
 General distribution : India (North India, Sikkim, West Bengal); China, Taiwan.

Cymbidium dayanum Rchb. f., Gard. Chron. 1869: 710. 1869; Du Puy & Cribb, Gen. *Cymbidium* 84. 1988; Chowdhery, Orch. Fl. Arun. Pradh. 256-260. 1998; Bose *et al.* Orch. India. 178. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 261. 2002; Lucksom, Orch. Sikkim N.E. Himal. 370. t. 384, pl. 13. 2007; Misra, Orch. India. 290. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012 *et* McAllen Int. Orch. Soc. J.13(7): 7. 2012.

Cymbidium eburneum var. *dayana* (Reichb. f.) Hook. f., Fl. Brit. India 6: 12. 1890.

Cymbidium dayanum var. *austro-japonicum* Tuyama, Nakai, Ic. Pl. Asiat. Orient. 4: 363, t. 118. 1941.

C. simonsianum King & Pantl., J. Asiat. Soc. Bengal 64(3): 338. 1896; Bruhl, Guide Orch. Sikkim. 115. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 474. 1979.

Plant epiphytic herb, 27-83 cm tall. Pseudobulbs 3.8-4.2 cm long, sheathed. Leaves 5-7, 31-83 × 0.9-1.5 cm, distichous, linear-elliptic, acute, coriaceous. Inflorescence 8 to 13-flowered; peduncle 6-8 cm long; rachis 7-13 cm long; pedicellate-ovary 2-2.8 cm long. Flowers 4-4.8 cm across; whitish-purple; floral bracts triangular. Sepals subsimilar, 2.6-3 × 0.7-0.8 cm narrowly elliptic to oblong-lanceolate, acute, erect; lateral pair 2.6-3.1 × 0.8-0.9 cm. Petals 2-2.6 × 0.6-0.7 cm, oblong to elliptic, acute, porrect, covering the column. Lip 1.8-2.1 × 1.2-1.4 cm, 3-lobed, white with purple nerved; side lobes erect, clasping the column; apical lobe ovate, entire, deflexed, apex subacute, mucronate; disc 2-keels, hairy. Column 1.1-1.3 cm long, curved. Anther yellow; pollinia 2.

Flowering : August – November; Fruiting: October – December.
 Specimen cited : Latpanjar 700 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1471**, dt. 22. 09. 2010.
 Status : Rare.
 Local distribution : Jaldhaka, Mungpoo, Nimbong, Chisang-Godok, Pareng, 400 – 1000 m.
 General distribution : India (Sikkim); Bhutan, Cambodia, China, Japan, Ryukyu Island, Philippines, Sumatra, Taiwan, Thailand and West Malaysia.

Cymbidium devonianum Lindl. ex Paxt., Paxt.'s Mag. Bot. 10: 97 + fig. 1843. Hook. f., Fl. Brit. India 6: 10. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 190, t. 253. 1898; Bruhl, Guide Orch. Sikkim. 115. 1926; Tuyama in Hara, Fl. E. Himal. 1: 430. 1966; Tuyama in Hara, Fl. E. Himal. 2: 183. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 474. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 58. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 260. 1998; Bose *et al.* Orch. India. 178. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 261-262. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 62-63. 2005; *et* 100 N.E. Indian Orch. 56-57. 2006; Lucksom, Orch. Sikkim N.E. Himal. 369-370. t. 383, pl. 13. 2007; Misra, Orch. India. 290. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012 *et* McAllen Int. Orch. Soc. J.13(7): 8. 2012.

Cymbidium sikkimense Hook. f., Fl. Brit. India 6(1): 9. 1890. [Plate 4.6]

Plant epiphytic herb, 26-40 cm tall. Pseudobulbs 2-3 × 1.4-1.9 cm, ovoid, sheathed. Leaves 2-4, 12-26 × 3.2-5 cm, elliptic, obtuse to subacute, oblique, mucronate, petiolate. Inflorescence pendent, densely 10 to 25-flowered; peduncle 6-9 cm long; rachis 10-23 cm long; pedicellate-ovary 1.3-1.7 cm long. Flowers 2.6-3.3 cm across, pale-green with dark purple nerved; floral bracts triangular. Sepals subsimilar, 2-2.7 × 0.8-1 cm, spreading, erect, elliptic, obtuse. Petals 1.8-2.2 × 0.7-0.9 cm, subquadrate, subacute to acute. Lip 1.5-1.6 × 1.1-1.4 cm, slightly 3-lobed, purple with dark maroon blotch; side lobes obscure; apical lobe triangular-ovate; disc with 2 lamellae. Column 1.1-1.3 cm, clavate, winged at apex; foot short. Anther dome shaped; pollinia 2.

Flowering	: April – June; Fruiting: June – September.
Specimen cited	: Toroyok Busty 1600 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0349 , dt. 28. 04. 2008.
Status	: Frequent.
Local distribution	: Lungshel, Lava, Takdah, Rammam, Baggonra, Sukiapokhari, Damsang forest, Toroyok, Takdah, Ramam, Baggonra, 1300 – 2400 m.
General distribution	: India (North East India, Sikkim, West Bengal); Bhutan, Myanmar, Nepal, Thailand, South China.

Cymbidium eburneum Lindl., Bot. Reg. 33: t.67. 1847; Hook. f., Fl. Brit. India 6: 11. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 196, t. 262. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 477. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 59. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 260. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 264. 2002; Lucksom, Orch. Sikkim N.E. Himal. 373-374. t. 389, pl. 14. 2007.

C. syringodorum Griff., Not. Pl. Asiat. 3: 338. 1851.

Cyperorchis eburnea (Lindl.) Schltr., Feddes Repert. Spec. Nov. Regni Veg. 20: 107. 1924.

Plant epiphytic herb, 30-54 cm tall. Pseudobulbs 6-10 × 2-3 cm, ovoid to fusiform, sheathed. Leaves 13-15, 30-60 × 1.3-2 cm, distichous, linear, tip unequally 2-lobed; leaf base broad, sheathing. Inflorescence erect 1 to 3-flowered; peduncle 11-15 cm long; rachis short, 5-7 cm long; pedicel and ovary 3.2-4 cm long. Flowers 7.5-11 cm across, white or pale pink, lip bright yellow; floral bracts triangular, shorter than the ovary. Sepals similar, oblong-elliptic, acute, concave; dorsal sepal 6.5-7 × 2-2.4 cm; lateral pair 6-6.7 × 2-2.3 cm, slightly curved. Petals 5-6.5 × 1.5-2.3 cm, spatulate, sub-falcate, acute, tips recurved. Lip 4.5-5.5 × 2.5-3.4 cm, 3-lobed, oblong-obovate; side lobes clasping the column, papillose, apex rounded; apical lobe deflexed, ovate-triangular, rounded to mucronate; disc with 3 hairy lamellae. Column 4.5-5.5 cm long clavate, winged. Anther dome shaped; pollinia 2.

- Flowering : March – May; Fruiting: May – July.
 Specimen cited : Mungpoo 1100 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1765**, dt. 05. 05. 2013.
 Status : Threatened.
 Local distribution : Mim forest, Munsong, Nagari, 300 – 1700 m.
 General distribution : Nepal, North East India, Myanmar and South China.

Cymbidium erythraeum Lindl., J. Proc. Linn. Soc., Bot. 3: 30. 1859; Hook. f., Fl. Brit. India 5: 857. 1890; Deva & Naithani, Orch. N.W. Himal. 199-200 t. 110. 1986; Pearce & Cribb, Fl. Bhutan, 3(3): 262. 2002; M. Pradhan, 100 N.E. Indian Orch. 58-59. 2006; Luckson, Orch. Sikkim N.E. Himal. 372. t. 387, pl. 14. 2007; Misra, Orch. India. 290. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Lif. Sci. 3(3): 1540. 2012 *et* McAllen Int. Orch. Soc. J. 13(7): 10. 2012.

Cymbidium longifolium sensu Lindl., Gen. Sp. Orchid. Pl.: 163. 1833; Bruhl, Guide Orch. Sikkim. 117. 1926.

Plant epiphytic herb, 36-78 cm tall. Pseudobulbs 4-8 × 3-5 cm, ovoid. Leaves 8-13, 31-70 × 1-1.8 cm, distichous, linear-oblong, acute. Inflorescence arching, 5 to 14-flowered; peduncle 9.5-20 cm long; rachis 13-25 cm long, slender; pedicellate-ovary 1.2-1.8 cm long. Flowers 4-5 cm across, greenish, spotted and striped red-brown; floral bracts triangular. Sepals similar, narrowly obovate, acute; dorsal sepal 4-4.5 × 1.2-1.4 cm; lateral pair 4.5-4.7 × 1.1-1.4 cm. Petals 4.6-4.9 × 0.6-0.8 cm, spreading, oblong, acute, falcate. Lip 3.1-3.5 × 1.8-2 cm, 3-lobed, yellowish to white, spotted red-brown, adnate to base of the column; side lobes erect, acute; apical lobe cordate-reniform, acute, papillose; disc with 2 hairy lamellae. Column 2.3-2.9 cm long, winged, sparsely hairy. Anther ovoid; pollinia 4.

- Flowering : August – October; Fruiting: October – December.

Specimen cited : Neora Valley 2300 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1432**, dt. 17. 08. 2010.
 Status : Rare.
 Local distribution : Lava, Algarah, Ramam, Tangta, Senchale, 1800 – 2700 m.
 General distribution : India (North India, Sikkim, West Bengal).

Cymbidium hookerianum Rchb. f., Gard. Chron. 1966: 7. 1866; Du Puy *et al.*, Kew Bull. 40: 431. 1985; Pradhan, Indian Orch. Guide Identif. Cult. 2: 477. 1979; Deva & Naithani, Orch. N.W. Himal. 361-365. t. 363. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 60. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 267. 1998; Bose *et al.* Orch. India. 180. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 262-263. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 66-67. 2005; *et* 100 N.E. Indian Orch. 60-61. 2006; Lucksom, Orch. Sikkim N.E. Himal. 371-372. t. 386, pl. 14. 2007; Misra, Orch. India. 291. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Lif. Sci. 3(3): 1540. 2012 *et* McAllen Int. Orch. Soc. J. 13(7): 11. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 132. 2013.

Cymbidium grandiflorum Griff., Itin. Pl. Khasyah Mts.: 145, no.698. 1848; Not. Pl. Asiat. 3: 342 1851; Ic. Pl. Asiat. 3: t.321. 1851; Hook. f., Fl. Brit. India 6: 12. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 192, t. 256. 1898; Bruhl, Guide Orch. Sikkim. 116. 1926; Tuyama in Hara, Fl. E. Himal. 1: 430. 1966; Tuyama in Hara, Fl. E. Himal. 2: 183. 1971.

C. giganteum var. *hookerianum* (Rchb. f.) Bois *ex* Cogniaux, Lindenia 9: 13. 1893.

Cyperorchis grandiflora (Griff.) Schltr., Feddes Repert. Spec. Nov. Regni Veg. 20: 107. 1924.

Plant epiphytic herb, 45-75 cm tall. Pseudobulbs 4-5.5 × 2-3.5 cm, narrowly ovoid. Leaves 6-10, 36-48 × 2-2.8 cm, linear-elliptic, acute, base sheathing. Inflorescence 9 to 16-flowered; peduncle 8-12 cm long, suberect; rachis 18-28 cm long; pedicellate-ovary 3.8-5.7 cm long. Flowers 5-7 cm across, yellowish-green; floral bracts triangular. Sepals subsimilar, 5.7-6 × 1.8-2 cm, narrowly obovate, acute; dorsal sepal porrect; lateral pair spreading. Petals 5.3-5.5 × 1.2-1.4 cm, spreading, oblong to narrowly obovate, curved. Lip 4.5-4.9 cm, 3-lobed, spotted with brownish-purple spots; side lobes narrow, acute, margins ciliate; apical lobe ovate-cordate, mucronate, deflexed, margin erose-undulate; disc with 2 hairy lamellae. Column 3.3-4 cm long, winged. Anther yellow; pollinia 2.

Flowering : March – May; Fruiting: April – August.
 Specimen cited : Jarebuttee forest – Neora Valley 2200 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0291**, dt. 10. 04. 2008.
 Status : Threatened.
 Local distribution : Todey, Tangta, Baggonra, 2200 – 2800 m.

General distribution : India (North East India, Sikkim, West Bengal),
East Nepal, South West China.

Cymbidium iridioides D. Don, Prodr. Fl. Nepal.: 36. 1825; Hook. f., Fl. Brit. India 6: 14. 1890; Du Puy *et al.*, Kew Bull. 40: 430. 1985; Pradhan, Indian Orch. Guide Identif. Cult. 2: 476. 1979; Deva & Naithani, Orch. N.W. Himal. 199-200 t. 110. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 267. 1998; Bose *et al.* Orch. India. 180. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 263. 2002; Lucksom, Orch. Sikkim N.E. Himal. 371. t. 385, pl. 14. 2007; Misra, Orch. India. 291. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1540. 2012 *et McAllen Int. Orch. Soc. J.* 13(7): 12. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 134. 2013.

Cymbidium giganteum sensu Wall. *ex* Lindl., Gen. Sp. Orchid. Pl.: 163. 1833, non sw. 1799; Hook. f., Fl. Brit. India 6: 12-13. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 191, t. 255. 1898; Bruhl, Guide Orch. Sikkim. 117. 1926; Banerji, Orch. Nepal. 103. 1982.

Iridorchis gigantea (Wall. *ex* Lindl.) Bl., Coll. Orchid.: 91, t.26. 1858.

Cyperorchis gigantea (Wall. *ex* Lindl.) Schltr., Feddes Repert. Spec. Nov. Regni Veg. 20: 107. 1924.

Plant epiphytic herb, 43-79 cm tall. Pseudobulbs 6-11 × 2.3-5 cm, narrowly ovoid. Leaves 6-10, 30-60 × 2.5-5 cm, linear-oblong, tip acute. Inflorescence 8 to 16-flowered; peduncle 12-17 cm long, sheathed; rachis 23-41 cm long; pedicel and ovary 3-4.4 cm long. Flowers 3.6-7 cm across, fragrant; yellowish-green, nerved red-brown; floral bracts triangular. Sepals subsimilar, narrowly obovate, acute, concave, porrect; dorsal sepal 4.5-4.8 × 1.5-1.8 cm, elliptic-oblong, acute; lateral pair 4.3-4.7 × 1.2-1.7 cm, elliptic-oblong, slightly falcate. Petals 4.4-4.7 × 0.8-1 cm, spreading, oblong, curved. Lip 2-3 × 1.5-2.3 cm, 3-lobed, yellowish, red-spotted; side lobes large elliptic, rounded, erect; apical lobe oblong-ovate, deflexed, margins undulate-crenate; disc with 2 hairy lamellae. Column 2.7-3 cm long, clavate, winged. Anther scabrid; pollinia ovoid.

Flowering : October – November; Fruiting: November – January.

Specimen cited : Neora Valley 2400 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1745**, dt. 24. 11. 2011.

Status : Frequent.

Local distribution : Algarah, Lava, Todey, Damsang Gari, Chimney-Kurseong, Baggonra, 1100 – 2400 m.

General distribution : India (North East India, Sikkim, West Bengal); Myanmar, Nepal, South West China.

Cymbidium lancifolium Hook., Exot. Fl.: 51. 1823; Hook. f., Fl. Brit. India 6: 9. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 185, t. 247. 1898; Du Puy & Lamb, Orchid Rev. 92: 352-353, t.294. 1984; Du Puy & Cribb, Gen. *Cymbidium*

186. 1988; Bruhl, Guide Orch. Sikkim. 113. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 470. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 61. 1997; Banerji, Orch. Nepal. 104. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 270. 1998; Bose *et al.* Orch. India. 180. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 269 & 271. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 68-69. 2005; Lucksom, Orch. Sikkim N.E. Himal. 367-368. t. 380, pl. 13. 2007; Misra, Orch. India. 291. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 10. 2012; *et* 13(7): 13. 2012.

C. javanicum Bl., *op. cit.* 380. 1825.

C. gibsonii Lindl. & Paxt., Paxt.'s Fl. Gard. 3: 144. 1852-3.

C. javanicum var. *pantlingii* F. Mackawa, *loc. cit.* 1958.

Plant terrestrial herb, 17-38 cm tall. Pseudobulbs 7-12 × 0.9-1.3 cm, fusiform. Leaves 2-5, 11-23 × 2.8-4 cm, narrowly obovate-elliptic, acute, petiolate. Inflorescence erect, 4 to 7-flowered; peduncle 2.1-4 cm long, sheathed; rachis 5-8 cm long; pedicellate-ovary 2.2-2.8 cm long. Flowers 3.9-4.5 cm across, whitish-green with purple stripe; floral bracts lanceolate. Sepals similar, 1.8-2.7 × 0.4-0.7 cm, narrowly oblong to obovate, acute. Petals 1.7-2.1 × 0.6-0.7 cm, oblong to elliptic, acute. Lip 1.4-1.7 × 0.8-1.3 cm, 3-lobed; side lobes narrow, rounded; apical lobe ovate, obtuse, recurved at apex; disc with 2 lamellae. Column 1-1.2 cm long, slender, curved, winged. Anther quadrate; pollinia 4.

Flowering : March – April; Fruiting: April – June.

Specimen cited : Algarah forest 1800 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0796**, dt. 25. 03. 2009.

Status : Rare.

Local distribution : Lopchu, Chimney, Damsang gari, Munsong, 300 – 2300 m.

General distribution : India, (North India, Sikkim, West Bengal), Bhutan, Borneo, China, Indo-China to Malaysia, Java, Japan, Sumatra, Taiwan.

Cymbidium longifolium D. Don, Prodr. Fl. Nepal.: 36. 1825; Hook. f., Fl. Brit. India 5: 857. 1890; Bruhl, Guide Orch. Sikkim. 117. 1926; Tuyama in Hara, Fl. E. Himal. 1: 430. 1966; Tuyama in Hara, Fl. E. Himal. 2: 183. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 476. 1979; Banerji, Orch. Nepal. 104. 1982; Deva & Naithani, Orch. N.W. Himal. 365 – 367 t. 366. 1986; Bose *et al.* Orch. India. 180. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 265-266. 2002; Lucksom, Orch. Sikkim N.E. Himal. 375-376. t. 393, pl. 14. 2007; Misra, Orch. India. 291. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 136. 2013.

Cymbidium elegans Lindl., Gen. Sp. Orchid. Pl.: 161. 1833.

Cyperorchis elegans (Lindl.) Bl., Rumphia 4: 47. 1849.

Cymbidium densiflorum Griff., Not. Pl. Asiat. 3: 337. 1851.

Grammatophyllum elegans (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 3: 548. 1853.
Cymbidium elegans var. *lutescens* Hook. f., Fl. Brit. India 6(1): 15. 1890.
Cyperorchis longifolia (D. Don) Schltr., Feddes Repert. Spec. Nov. Regni Veg. 20: 108. 1924.

Plant epiphytic herb, 38-75 cm tall. Pseudobulbs 5.6-7.5 × 3-3.8 cm, ovoid. Leaves 7-11, 33-61 × 1.6-2 cm, distichous, linear-elliptic, acute, tip slightly 2-lobed. Inflorescence densely 13 to 23-flowered; peduncle 13-19 cm long, sheathed; rachis 11-23 cm long, slender, pendent; pedicellate-ovary 1.7-2.1 cm long. Flowers 3.7-4 cm across, pale yellow; floral bracts triangular. Sepals similar, 3.5-4.4 × 0.8-1 cm, narrowly obovate, acute, concave; dorsal sepal porrect, covering column; lateral pair mucronate. Petals 3.3-4.1 × 0.6-0.7 cm, narrowly oblong-obovate, obtuse, slightly falcate, porrect. Lip deltoid, elongate, 3-lobed, adnate to base of column; side lobes broad, erect or clasping the column, apex subacute, entire; apical lobe orbicular, acute, decurved, apex 2-lobed, emarginated, margins undulate. Column 3-3.7 cm long, slender, narrowly winged. Anther dome shaped; pollinia ovate.

Flowering : October – December; Fruiting: November – January.
 Specimen cited : Gumbadara forest 2100 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0724**, dt. 23. 10. 2008.
 Status : Rare.
 Local distribution : Algarah, Lava, Takdah, Kafer forest, 1700 – 2300 m.
 General distribution : India, (North East India, Sikkim, West Bengal), Myanmar, Nepal, South West China.

Cymbidium lowianum (Rchb. f.) Rchb. f., Gard. Chron. 11:332, 404, t. 56. 1879; Du Puy *et al.* Kew Bull. 40: 421-434. 1985; Hook. f., Fl. Brit. India 5: 857. 1890; Chowdhery, Orch. Fl. Arun. Pradh. 270. 1998; Bose *et al.* Orch. India. 182. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 271. 2002; M. Pradhan, 100 N.E. Indian Orch. 62-63. 2006; Misra, Orch. India. 291. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* McAllen Int. Orch. Soc. J.13(7): 14. 2012.

Cymbidium giganteum var. *lowianum* Reichb. f., Gard. Chron. 7: 685. 1877; Hook. f., Fl. Brit. India. 6: 13. 1890.

Plant epiphytic herb, 30-68. Pseudobulbs narrowly ellipsoid, bilaterally flattened. Leaves 6-9, 50-85 × 3.5-4 cm, linear-oblong, acute, base sheathing. Inflorescence 55-80 cm long, 10 to 20-flowered, racemes, arching; pedicellate-ovary 5-5.5 × 0.5-0.7 cm. Flowers 7-10 cm across, yellowish-green, floral bracts ovate. Sepals and petals green, obovate. Dorsal sepal 5.9-6.2 × 1.9-2.2 cm, lanceolate, ovate; lateral pair 5.2-5.5 × 1.5-1.8 cm, ovate-elliptic, slightly falcate; petals 5.3-5.7 × 1.3-1.7 cm, lanceolate, ovate. Lip 3.4-3.9 × 1.5-1.8 cm, 3-lobed, broadly ovate, pale yellow to whitish; upper margin of epichile is blackish dark coloured and at the claw red dotted marks; side lobes triangular; apical lobe cordate, margin erose or with a V-

shaped red to pale chestnut or pale brown patch at apex; disc with 2 lamellae. Column 2.9-3.3 × 0.9-1 cm, winged, lower half of inner side possess red dotted marks. Anther yellow; pollinia ovoid.

Flowering	: February – June; Fruiting: May – August.
Specimen cited	: Todey forest 1400 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1094 , dt. 25. 03. 2010.
Status	: Cultivated.
Local distribution	: Neora Valley Wild Life Quarter, Lloyd Botanical Garden, N.R.C. Orchids, I.C.A.R., Darjeeling Campus; (Cultivated condition in Kalimpong, Kurseong and Darjeeling), 1200 – 2700 m.
General distribution	: South East and South West Yunnan (Myanmar, Thailand).

Note: Intraspecific floral colour variation in *Cymbidium lowianum* (Rchb. f.) Rchb. f. [Plate 4.7]

Floral morphology of 2 specimens are same but distinct variation was observed on the floral parts and on lip colouration. In specimen A and A1, distinct brown longitudinal nerves are present on dorsal sepal, lateral sepals, petals and V-shaped red to pale chesnut or pale brown patch at apex of apical lobe whereas in specimen B and B1 longitudinal nerves are totally absent in floral parts and V-shaped light pale brown patch at the apex of apical lobe. Therefore, colour variation is not a great criteria in plant taxonomy and it can not be categorized in new species, variety or forma but it is an intraspecific variation on the natural population of *Cymbidium lowianum* (Rchb. f.) Rchb. f.

Cymbidium mastersii Griff. ex Lindl., Bot. Reg. 31: t.50. 1845; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 195, t. 261. 1898; Bruhl, Guide Orch. Sikkim. 118. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 478. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 274. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 264-265. 2002; Lucksom, Orch. Sikkim N.E. Himal. 374. t. 390, pl. 14. 2007; Misra, Orch. India. 291. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012 *et* McAllen Int. Orch. Soc. J. 13(7): 15. 2012.

Cymbidium affine Griff., Not. Pl. Asiat. 3: 336 (1851); Icon. Pl. Asiat. 3: t.291. 1851. *C. micromeson* Lindl., J. Proc. Linn. Soc., Bot. 3: 29. 1859.

Cyperorchis mastersii (Griff. ex Lindl.) Benth., J. Linn. Soc., Bot. 18: 318. 1881; Hook. f., Fl. Brit. India 6: 15. 1890.

Cymbidium maguanense F.Y. Liu, Acta Bot. Yunnan 18(4); 412, f.2 1996.

Plant epiphytic herb, 28-43 cm tall. Pseudobulbs 8-11 cm long, sheathed. Leaves 10-14, 22-51 × 1.4-1.7 cm, distichous, narrowly oblong, acute, unequally 2-lobed, mucronate. Inflorescence curved to pendent, 14-23 cm long, densely 3 to 8-flowered;

peduncle sheathed; rachis 5-15 cm long; pedicellate-ovary 2.9-3.4 cm long. Flowers 5.2-5.8 cm across, white; floral bracts triangular. Sepals similar, narrowly obovate, acute, concave, porrect. Dorsal sepal 4.7-5.3 × 0.8-1 cm; lateral pair 5-5.4 × 0.9-1.1 cm, slightly falcate. Petals 4.5-4.9 × 0.5-0.6 cm, narrowly oblong to obovate, slightly falcate, porrect. Lip 4.5-4.8 × 2.1-2.5 cm, 3-lobed, elongate; side lobes clasping the column; apical lobe ovate, rounded, porrect, margins undulate; disc with 2 lamellae. Column 3.5-3.9 cm long, slender, narrowly winged. Anther sessile; pollinia clavate.

Flowering : October – December; Fruiting: November – January.
Specimen cited : Kafer forest 1800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1773**, dt. 13. 12. 2011.
Status : Threatened.
Local distribution : Neora Valley, Rambh forest, 900 – 2300 m.
General distribution : India (North East India, Sikkim); China, Myanmar, Thailand.

Tribe **Arethuseae** Lindl.

Subtribe **Bletiinae** Benth.

Acanthephippium Bl.

Plant terrestrial; pseudobulbs with short unbranched stem. Leaf plicate; petioles sheathing. Inflorescence raceme, lateral, arising from node on new shoot or pseudobulb, few-flowered; floral bracts leafy, boat-shaped. Flower few, showy, fleshy, urceolate to campanulate; pedicellate-ovary grooved, finely hairy. Sepals united, the lateral pair adnate to the long foot of the column to form a mentum. Petals erect, elliptic, included in the tube formed by the sepals. Lip 3-lobed, mobile, stipitate, with broad incurved side lobes and a small triangular terminal lobe; disc keeled. Column stout, winged with long foot. stigma ovate to obovate; pollinia 8.

The genus *Acanthephippium* Bl., comprises about 11 species distributed in South East Asia, Japan, the Malay Archipelago and the Pacific Islands. Commonly it is known as 'jug orchid'.

Acanthephippium striatum Lindl., Bot. Reg. 24: 41, misc. 68. 1838; Hook. f., Fl. Brit. India 5: 816. 1890; Hedge, Jour. Bombay Nat. Hist. Soc. 82(1): 118. 1985; Bruhl, Guide Orch. Sikkim. 80. 1926; Tuyama in Hara, Fl. E. Himal. 2: 176. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 246. 1979; Hedge, Orch. Arun. Pradh. 43. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 26. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 43. 1998; Bose *et al.* Orch. India. 77. 1999; Pearce & Cribb, Fl.

Bhutan, 3(3): 274 & 276, t. 275. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 70-71. 2005; *et* 100 N.E. Indian Orch. 68-69. 2006; Lucksom, Orch. Sikkim N.E. Himal. 395-396. t. 406, pl. 15. 2007; Misra, Orch. India. 280. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 8. 2012.

Plant terrestrial herb, 33-51 cm tall. Pseudobulbs 7-14 × 2.5-3 cm, ovoid to cylindrical. Leaves 2, 16-26 × 6-11 cm, elliptic to obovate, acute, petiolate. Inflorescence 3 to 8-flowered; peduncle 7-10 cm long, bracteate; rachis 3-5 cm long; pedicellate-ovary grooved. Flowers 2.5-3 cm long, white with reddish-purple nerved; floral bracts leafy. Dorsal sepal 2-2.8 × 1.2-1.4 cm, oblong, obtuse, adnate to lateral pair; lateral pair 2.1-3 × 1.7-2 cm, obliquely oblong, obtuse, recurved. Petals 2.3-2.6 × 0.9-1.1 cm, obovate to oblong, fleshy, minutely pubescent at base. Lip 2-2.5 × 1.1-1.2 cm, 3-lobed, membranous; side lobes erect, rounded; apical lobe triangular; callus on disc, low median keel; mentum narrowed towards apex, spur-like. Column 1.2-1.5 × 0.4-0.5 cm, straight; foot forming a mentum. Anther 3-4 mm long; pollinia 8.

Flowering : May – July; Fruiting: June – August.
Specimen cited : Damsang Gari 1600 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0920**, dt. 03. 06. 2010.
Status : Rare.
Local distribution : Kumsi forest, Sittong, Chisang-Godok, 700–1700 m.
General distribution : India (Sikkim, West Bengal); China, Java, Malaysia, Taiwan, Thailand and Vietnam.

Anthogonium Wall. *ex* Lindl.

Plants terrestrial, slender. Pseudobulbs small, ovoid. Stem leafy, arising from pseudobulb apex. Leaves 3-5, sessile, linear, sheathing. Inflorescence lateral or basal from pseudobulb, racemes to sub-paniculate. Flowers resupinate, slightly tubular. Sepals connate into a sepaline tube, the upper halves free, oblanceolate, spreading. Petals elongate-spathulate. Lip simple, adnate to the column base, convolute, subtriangular in outline, apex obscurely 3-lobed. Column long, slender, apex dilated and abruptly bent. Anther 4-celled; pollinia 4.

The monotypic genus *Anthogonium* Wall. *ex* Lindl., is distributed from the Himalayas, through Myanmar, China and South East Asia.

Anthogonium gracile Lindl., Gen. Sp. Orchid. Pl.: 426. 1840; Hook. f., Fl. Brit. India 5: 822. 1890; Bruhl, Guide Orch. Sikkim. 73. 1926; Tuyama in Ohashi, Fl. E. Himal. 3: 137. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 247. 1979; Banerji, Orch. Nepal. 87. 1982; Hedge, Orch. Arun. Pradh. 43. 1984; Pradhan &

Pradhan, 100 Beaut. Orch. 32. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 65. 1998; Bose *et al.* Orch. India. 92. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 279 & 281, t. 280. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 74-75. 2005; Lucksom, Orch. Sikkim N.E. Himal. 394-395. t. 405, pl. 15. 2007; Misra, Orch. India. 281. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et McAllen* Int. Orch. Soc. J., 13(4): 8. 2012.

Anthogonium sp. Griffith, Not. Pl. Asiat. 3: 383 1851; Icon. Pl. Asiat. 3: t. 345. 1851.

A. griffithii Rchb. f., Bonplandia 2: 90. 1851.

A. corydaloides Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 4: 66, 230. 1919. [Plate 4.23. B]

Plant terrestrial herb, 16-47 cm tall. Pseudobulbs 0.8-3 × 0.8-2.5 cm, ovoid. Stem sheathed. Leaves 3-5, 8-39 × 1.3-3.1 cm, oblong-lanceolate to narrowly elliptic, acuminate. Inflorescence laxly 6 to 12-flowered; peduncle 11-33 cm long, slender; rachis 1.5-8 cm long; pedicellate-ovary 1-1.8 cm long. Flowers 1.4-1.8 cm long, purple to white; floral bracts lanceolate. Sepals 1.5-1.9 cm long, oblanceolate, slightly falcate, subacute, connate in lower half to form a narrow, cylindrical sepaline tube. Petals 1-1.5 cm long, elongate-spathulate, linear at base. Lip 1.4-1.5 × 1-1.1 cm, simple, spotted dark purple, adnate to column base; base narrow, expanding towards tip; apex obscurely 3-lobed, emarginated. Column 7-8 mm long slender, apex dilated, abruptly bent and 2-winged at apex. Anther 4-celled; pollinia 4.

Flowering : August – October; Fruiting: October – January.

Specimen cited : Dello Hill 1480 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0578**, dt. 01. 08. 2008.

Status : Frequent.

Local distribution : Lava, Samalbong, Samthar, Kafer, Ramam, Dhotray, Kalpokhari, Tonglu, Serikhola, Jalapahar, Senchale, Rimbick, Manaybhanjang, 1200 – 2800 m.

General distribution : India (North India, Sikkim, West Bengal); Bhutan, Cambodia, China, Laos, Myanmar, Nepal, Thailand and Vietnam.

Calanthe R. Br.

Plants terrestrial herbs, stems pseudobulbous; pseudostems covered by leaves. Leaves 2 to several, elliptic-oblong, plicate, petiolate to sessile. Inflorescence usually from amongst the leaves and axillary, terminal or from the base of pseudobulb, erect, long or short, few to many-flowered, racemes. Flowers resupinate, small to large and showy. Sepals and petals similar, free, spreading, rarely connivent. Lip entire, 3 or 4-lobed, adnate to column base, spurred; apical

lobe often deeply bifid; disc with lamellae. Column short, sometimes dilated. Anther usually conical, 2-celled. pollinia 8.

The genus *Calanthe* R. Br., comprises about 100 species from Africa to Asia and the Pacific Islands with 1 species in the tropical Americas.

Key to the species

- 1. Flowers spurless *C. puberula*
- 1a. Flowers with a spur2

- 2. Lip simple.....3
- 2a. Lip 3-lobed4

- 3. Lip base long-clawed, apex deeply 2-lobed *C. biloba*
- 3a. Lip base short clawed, apex acuminate.....*C. trulliformis*

- 4. Spur less than 3 mm long..... *C. brevicornu*
- 4a. Spur more than 4 mm long5

- 5. Flowers yellow-green, brownish purple or white.....6
- 5a. Flowers whitish-purple *C. sylvatica*

- 6. Sepals and petals white*C. triplicata*
- 6a. Sepals and petals green or brown *C. yuksomnensis*

Calanthe biloba Lindl., Fol. Orchid. Calanthe 6,7: 3, no.5. 1854; Hook. f., Fl. Brit. India 5: 848. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 169, t. 228. 1898; Bruhl, Guide Orch. Sikkim. 105. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 255. 1979; Hedge, Orch. Arun. Pradh. 44. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 162. 1998; Bose *et al.* Orch. India. 135. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 284. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 78-79. 2005; Lucksom, Orch. Sikkim N.E. Himal. 422-423. t. 445, pl. 16. 2007; Misra, Orch. India. 285. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 9. 2012.

Calanthe biloba var. *obtusata* Par. & Rehb. f., Trans. Linn. Soc. London 30: 144. 1874.

C. biloba var. *treutleri* Hook. f., loc. cit. 1890.

Alismorchis biloba (Lindl.) Kuntze, Revis. Gen. Pl. 2: 650. 1891.

Plant terrestrial herb, 43-65 cm tall. Pseudobulbs 5-13 × 0.6-0.7 cm, stout, cylindrical. Stem sheathed. Leaves 4-6, 13-32 × 7-12 cm, unequal, broadly elliptic, caudate-acuminate, margins undulate, petiolate. Inflorescence terminal, subdensely to densely 26 to 37-flowered; peduncle 14-31 cm long; rachis 10-23 cm long;

pedicellate-ovary 1.7-3 cm long. Flowers 2-3 cm across, whitish-purple; floral bracts linear-lanceolate. Sepals 1.5-1.9 × 0.8-1.1 cm, subsimilar, spreading, broadly ovate-lanceolate, caudate-acuminate; lateral pair 1.7-2.1 × 0.7-0.9 cm, falcate. Petals 1.1-1.4 × 0.3-0.5 cm, oblong, tip widely triangular. Lip 1.4-1.7 cm long, simple, clawed, spurred; apical lobe deeply 2-lobed; lobes acute, deflexed, margins undulate; sinus narrow, apiculate; spur conical. Column 2-4 mm long. Anther yellow; pollinia 8.

- Flowering : September–December; Fruiting: November–January.
Specimen cited : Charkhol forest 1550 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0728**, dt. 25. 10. 2008.
Status : Common.
Local distribution : Kafer, Lopchu, Lava, Algarah, Gumbadara, Senchale, Lloyd Botanical Garden – Darjeeling, 1000 – 2900 m.
General distribution : India (North East India, Sikkim); Bhutan, Nepal, Myanmar, S.W. China.

Calanthe brevicornu Lindl., Gen. Sp. Orchid. Pl.: 251. 1833; Hook. f., Fl. Brit. India 5: 848. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 168, t. 227. 1898; Bruhl, Guide Orch. Sikkim. 105. 1926; Tuyama in Hara, Fl. E. Himal. 2: 179. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 255. 1979; Hedge, Orch. Arun. Pradh. 44. 1984; Deva & Naithani, Orch. N.W. Himal. 219 – 223. t. 221. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 162. 1998; Bose *et al.* Orch. India. 135. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 284-285. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 80-81. 2005; Lucksom, Orch. Sikkim N.E. Himal. 424-425. t. 449, pl. 16. 2007; Misra, Orch. India. 285. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et McAllen* Int. Orch. Soc. J., 13(4): 9. 2012.

Calanthe brevicornu var. *wattii* Hook. f., Fl. Brit. India 5(2): 848. 1890.

Alismorchis brevicornu (Lindl.) Kuntze. Revis. Gen. Pl. 2: 650. 1891.

Calanthe lamellose Rolfe, Bull. Misc. Inform. Kew 1896: 197. 1896.

C. yunnanensis Rolfe, J. Linn. Soc., Bot. 36: 27. 1903.

C. scaposa Z.H. Tsi & K.T. Lang, Acta Phytolax. Sin. 23 (5): 385. 1985.

Plant terrestrial herb, 31-46 cm tall. Pseudobulbs 2 × 1.5 cm, small, ovoid, pointed. Leaves 3 or 4, 15-35 × 5-8 cm, ovate-elliptic, acuminate, petiolate. Inflorescence terminal, laxly 8 to 15-flowered; peduncle 18-30 cm long, puberulous; rachis 18-28 cm long; pedicellate-ovary hairy. Flowers 3-4 cm across, white with brownish-purple striped; floral bracts lanceolate. Sepals 1.5-1.9 × 0.5-0.7 cm, similar, spreading, ovate-lanceolate, acute. Petals 1.4-1.7 × 0.5-0.6 cm, shorter than the sepals, lanceolate, acute. Lip 1-1.2 × 0.9-1.2 cm, 3-lobed, adnate to column base, shortly spurred; side lobes oblong, obtuse, diverging; apical lobe broadly ovate, apex emarginated-apiculate, margins undulate, clawed at base, with 3 fleshy lamellae from apical lobe base, enlarging towards tip. Column 2.5-2.9 mm long. Pollinia 8.

Flowering : May – July; Fruiting: June – September.
 Specimen cited : Ramam forest 2400 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 9290**, dt. 27. 05. 2008.
 Status : Common.
 Local distribution : Gorkhey, Lopchu, Lava, Algarah, Kafer, Ghoom, Takdah, 1400 – 2700 m.
 General distribution : India (North East India, Sikkim); Bhutan, Myanmar, Nepal.

Calanthe puberula Lindl., Gen. Sp. Orchid. Pl.: 252. 1833; Hook. f., Fl. Brit. India 5: 848. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 166, t.224. 1898; Bruhl, Guide Orch. Sikkim. 104. 1926; Tuyama in Ohashi, Fl. E. Himal. 3: 139. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 254. 1979; Deva & Naithani, Orch. N.W. Himal. 227. t. 226. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 171. 1998; Bose *et al.* Orch. India. 139. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 289-290. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 84-85. 2005; Lucksom, Orch. Sikkim N.E. Himal. 421. t. 442, pl. 16. 2007; Misra, Orch. India. 286. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 9. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 108. 2013.

Alismorchis puberula (Lindl.) Kuntze, Revis. Gen. Pl. 2: 650. 1891.

Calanthe amoena W.W. Sm., Notes Roy. Bot. Gard. Edinburgh 13: 191. 1921.

C. lepida W.W. Sm., *op. cit.* 192. 1921.

Paracalanthe reflexa var. *puberula* (Lindl.) Kudo, J. Soc. Trop. Agric. 2: 236. 1930.

Plant terrestrial herb, 23-36 cm tall. Pseudobulbs 3-5 × 1-1.4 cm, conical, pseudostem 5-11 cm long. Leaves 5-7, 7-20 × 4.7-6 cm, elliptic-oblong, acuminate, petiolate. Inflorescence solitary, longer than leaves, terminal, laxly 7 to 14-flowered; peduncle 16-23 cm long; rachis 8-11 cm long, puberulous; pedicellate-ovary 1.3-2 cm long. Flowers 1.8-2.8 cm across, whitish-purple; floral bracts lanceolate. Sepals 1-1.2 × 0.6-0.7 cm, similar, spreading, ovate-lanceolate, slightly falcate, acuminate; lateral pair 1.2-1.4 × 0.6-0.8 cm. Petals 1-1.2 × 0.1 cm, linear-oblong, slightly falcate, acuminate. Lip 1-1.3 × 0.7-0.9 cm, 3-lobed, adnate to column base; side lobes oblong, falcate, obtuse; apical lobe clawed at base, ovate-orbicular, disc 2 calli at base. Column winged. Pollinia 8.

Flowering : June – August; Fruiting: July – September.
 Specimen cited : Baggonra forest 2100 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0816**, dt. 05. 06. 2009.
 Status : Common.
 Local distribution : Ramam, Mim Tea Estate, Sukiapokhari, Toroyok, Lava, Rachel forest, Palmajua, 1550 – 3200 m.
 General distribution : India (North East India); Bhutan, China, Japan, Nepal, Vietnam.

Calanthe sylvatica (Thour.) Lindl., Gen. Sp. Orchid. Pl.: 250. 1833; Pearce & Cribb, Fl. Bhutan, 3(3): 290-291. 2002; M. Pradhan, 100 N.E. Indian Orch. 74-75. 2006; Lucksom, Orch. Sikkim N.E. Himal. 430. t. 458, pl. 17. 2007; Misra, Orch. India. 286. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 9. 2012.

Centrosia sylvatica Thour., Hist. Orchid.: t.35, 36. 1822.

Amblyglottis emarginata Bl., Bijdr.: 370. 1825.

Bletia masuca D. Don, Prodr. Fl. Nepal: 30. 1825.

Zoduba masuca Buch.-Ham. *ex* D. Don, *loc. cit.* 1825.

Calanthe masuca (D. Don) Lindl., Gen. Sp. Orchid. Pl.: 249. 1833; Hook. f., Fl. Brit. India 5: 850. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 173, t.234. 1898; Bruhl, Guide Orch. Sikkim. 108. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 261. 1979; Banerji, Orch. Nepal. 96. 1982; Hedge, Orch. Arun. Pradh. 45. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 44. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 167. 1998; Bose *et al.* Orch. India. 137. 1999.

C. emarginata (Bl.) Lindl., *loc. cit.* 1833.

C. versicolor Lindl., Sert. Orchid.: t.42. 1838.

C. emarginata sensu Wight, Icon. Pl. Ind. Orient. 3: t.918. 1845, *non* (Bl.) Lindl.

C. wightii Rchb. f., Walpers, Ann. Bot. Syst. 6: 932. 1861.

C. textorii Miquel, Ann. Mus. Bot. Lugduno-Batavi 2: 204. 1866.

Alismorchis masuca (D. Don) Kuntze, Revis, Gen. Pl. 2: 650. 1891.

A. emarginata (Bl.) Kuntze, *loc. cit.* 1891.

Calanthe celebica Rolfe, Bull. Misc. Inform. Kew 1899: 129. 1899.

C. longicalcarata Hayata *ex* Yamamoto, Trans. Nat. Hist. Soc. Taiwan 20: 39. 1930.

C. seikooensis Yamamoto, J. Soc. Trop. Agric. 3: 237. 1931.

C. kintaroi Yamamoto, *op. cit.* 6: 550. 1934.

C. albolongicalcarata S.S. Ying, Bull. Exp. Forest Natl. Taiwan Univ. 114: 155. 1974. [Plate 4.23. A]

Plant terrestrial herb, 23-48 cm tall. Pseudobulbs 2-4.9 cm, narrowly conical-cylindric. Leaves 4-6, 13-37 × 3.7-12 cm, large, elliptic, acuminate, petiolate. Inflorescence terminal, laxly few to many-flowered; peduncle 21-37 cm long; rachis 5-11 cm long; pedicellate-ovary hairy. Flowers 2.5-4.3 cm across, whitish-purple; floral bracts ovate-lanceolate. Sepals subsimilar, broadly ovate-elliptic, acute; dorsal sepal 1.8-3.1 × 0.7-1.1 cm, slightly reflexed; lateral pair 1.9-3.2 × 0.7-1.1 cm, apiculate tip reflexed backward. Petals 1.3-1.9 × 0.5-0.7 cm, elliptic-ovate, acute. Lip 1-1.9 × 0.8-1.6 cm, 3-lobed, adnate to the column base, spurred; side lobes oblong-auriculate, obtuse, slightly falcate; apical lobe flabellate, reniform, apex emarginated; disc at base with 3 projecting, elongate, warty calluses; spur curved. Column 3.5-4 mm long. Anther white; pollinia 8.

Flowering : August – September; Fruiting: September – October.

Specimen cited : Kafer forest 1900 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1415**, dt. 09. 08. 2010.

Status : Rare.
Local distribution : Algarah, Takdah, Chimney-Kurseong, 300 – 2400 m.
General distribution : India (Sikkim); Bhutan.

Calanthe triplicata (Willem.) Ames, Philipp. J. Sci. 2: 326. 1907; Pearce & Cribb, Fl. Bhutan, 3(3): 293. 2002; Chowdhery, Orch. Fl. Arun. Pradh. 176. 1998; Chowdhery & Agrawala, A Century W.H. Orch. 110. 2013; Misra, Orch. Odisha. 110. 2014.

Flos triplicatus Rumphius, Herb. Amboin. 6: 115, t.52. f.2. 1750.

Orchis triplicata Willem., Usteri, Ann. Bot. 18: 52. 1796.

Limodorum veratrifolium Willd., Sp. Pl. ed. 4(1): 122. 1805.

L. ventricosum Steud., Nomencl. Bot. ed.1: 481. 1821.

Calanthe veratrifolia (Willd.) Ker Gawler, Bot. Reg. 9: t.720. 1823.

Amblyglottis veratrifolia (Willd.) Bl., Bijdr.: 370. 1825.

C. perottetii A. Rich., Ann. Sci. Nat. (Paris) Ser.2, 15: 68. 1841.

C. comosa Rchb. f., Linnaea 19(3): 374. 1846.

C. proboscidea Rchb. f., Gard. Chron. n.s. 21: 476. 1884.

C. matsamurana Schltr., Feddes Reperts. Spec. Nov. Regni Veg. 2: 168. 1906.

C. brevicolumna Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 328. 1911.

C. rubicallosa Masamune, J. Geobot. 23(2): t.7. 1975.

Plant terrestrial herb, 40-100 cm tall. Pseudobulbs 1.5-2.5 cm long. Leaves 3-6, 20-60 × 4.5-10 cm, narrowly elliptic-lanceolate, petiolate, ribbed. Inflorescence erect, densely many-flowered; peduncle 20-40 cm long; rachis 8-21 cm long; pedicel and ovary hairy. Flowers 4-5 cm across, white with pale green tips to the sepals, callus yellow to red-orange; floral bracts lanceolate. Sepals similar, 1.2-1.5 × 0.6-0.7 cm, elliptic-obovate, apiculate. Petals 1.2-1.4 × 0.5-0.7 cm, broadly oblong to oblanceolate, apiculate. Lip 1.3-1.8 × 1-1.3 cm, adnate to the column base, spurred, 3-lobed; side lobes oblong, obtuse, spreading; apical lobe deeply divided into 2 linear-oblong, falcately recurved segments; disc tuberculate; spur slender. Column puberulent.

Flowering : May – August; Fruiting: July – September.

Specimen cited : Godok 870 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1903**, dt. 15. 07. 2013.

Status : Rare.

Local distribution : Sangsay Bhalukhop, Sonada, Todey, Mungpoo, 700 – 1700 m.

General distribution : India, Sri Lanka, South East Asia, Indonesia, Japan and South to Australia and Fiji.

Calanthe trulliformis King & Pantl., J. Asiat. Soc. Bengal 64(3): 337. 1896 & Ann. Roy. Bot. Gard. Calcutta 8: 168, t.226. 1898; Chowdhery, Orch. Fl. Arun. Pradh. 176. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 293-294. 2002; Lucksom, Orch. Sikkim N.E. Himal. 423. t. 446, pl. 16. 2007.

Plant terrestrial herb, 18-62 cm tall. Pseudobulbs 1.5 - 2 cm long, oblong-ovoid. Leaves 3-6, 15-32 × 1.5-3 cm, linear-lanceolate, acute, petiolate. Inflorescence 22-40 cm long, terminal, subdensely many-flowered; peduncle puberulous, sheathed; rachis 5-15 cm long, puberulous; pedicel and ovary puberulous. Flowers 2-2.7 cm across, white pale-brown, spreading; floral bracts linear-lanceolate. Dorsal sepal 1.4-1.6 × 0.4-0.5 cm, ovate-lanceolate, acuminate to subcaudate; lateral pair 1.3-1.7 × 0.3-0.4 cm lanceolate, falcate, acute to acuminate. Petals 1-1.3 × 0.3-0.36 cm, linear-lanceolate, acute. Lip 1.1-1.3 cm, simple, white, clawed, margins entire at base and tip, irregularly crenate-dentate at sides, tip acuminate; disc with 2 converging lamellae; spur stout. Column 3.7-4 mm long. Anther cordate; pollinia 8.

Flowering : June – August; Fruiting: July – September.
Specimen cited : Lakpatar-Darjeeling, 2050 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1927**, dt. 24. 07. 2013.
Status : Rare
Local distribution : Baggonra, Chitrey, Dhotrey, Gumbadara, Jaributti-Neora Valley, 1800 – 2500 m.
General distribution : North East India, Bhutan, Myanmar.

Calanthe yuksomnensis Lucksom, J. Bombay Nat. Hist. Soc. 95(2): 319. 1998; Chowdhery, Orch. Fl. Arun. Pradh. 74. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 294-295. 2002; Lucksom, Orch. Sikkim N.E. Himal. 428-429. t. 456, pl. 17. 2007; Misra, Orch. India. 286. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* Life Sci. Bull. 9(2): 359 – 360. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 9. 2012.

Plant terrestrial herb, 20-34 cm tall. Pseudobulbs 2-3 × 1.6-2 cm, ovoid. Leaves 3, 20-30 × 7-12 cm, elliptic-lanceolate, acute, petiolate. Inflorescence 3 to 12-flowered; peduncle 14-24 cm long, erect, terete, puberulous, sheathed; rachis 5-8 cm long; pedicellate-ovary 2-2.4 cm long. Flowers 3.4-4.3 cm across, brownish-purple; floral bracts lanceolate. Sepals and petals brownish-purple with green tips and bases. Dorsal sepal 1.2-1.4 × 0.7-0.8 cm, elliptic, acute, puberulous externally; lateral pair 1.2-1.6 × 0.7-0.8 cm, spreading. Petals 1.4-1.6 × 0.4-0.5 cm, rhombic, subacuminate. Lip 2-2.3 × 1.6-1.7 cm, 3-lobed, creamy-white, spurred, base clawed and adnate to column; side lobes ovate-oblong, obtuse; apical lobe subreniform, 2-lobulate, lobules obtuse, crenulate; disc with 3 calluses; spur cylindrical. Column 7-7.5 mm long. Anther ovate; pollinia 8.

Flowering : April – June; Fruiting: May – July.
Specimen cited : Sukiapokhari forest 2200 m, **Rajendra Yonzone,**

	D. Lama and R. B. Bhujel 0853 , dt. 12. 05. 2009.
Status	: Rare.
Local distribution	: Takdah, Mim Tea Estate, Rambi forest, Dhotrey, 1700 – 2900 m.
General distribution	: India (Darjeeling, Sikkim).

Phaius Lour.

Plants perennial terrestrial herbs. Stems clustered, cylindrical or pseudobulbs. Pseudobulbs conical or ovoid. Leaves plicate, petiolate, obovate or narrowly elliptic, acuminate. Inflorescence lateral from base of pseudobulb, or axillary, laxly or densely racemes. Flowers usually large, resupinate, turning blue-black when old or damaged. Sepals and petals similar, free, spreading or reflexed. Lip free, entire to obscurely 3-lobed, erect, sessile partly adnate to and embracing the column to form a tube, gibbous or shortly spurred. Column fleshy, curved, with an inflexed foot; pollinia 8.

The genus *Phaius* Lour., comprises about 30 species distributed in the old world tropics of Africa, Madagascar, South and South East Asia, Australia, New Guinea and the Pacific Islands.

Key to the species

1. Inflorescence arising from leaf axil halfway up stem..... *P. mishmensis*
- 1a. Inflorescence arising from base of stem or side of pseudobulb.....2
2. Flowers more than 10 cm across; apical lobe of lip protruding; spur curved.....*P. tankervilleae*
- 2a. Flowers less than 6 cm across; apical lobe of lip not protruding; spur straight..... *P. flavus*

Phaius flavus (Bl.) Lindl., Gen. Sp. Orchid. Pl.: 128. 1831; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Hedge, Orch. Arun. Pradh. 45. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 105. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 582. 1998; Bose *et al.* Orch. India. 386. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 303, t. 304. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 90-91. 2005; Lucksom, Orch. Sikkim N.E. Himal. 433. t. 462, pl. 18. 2007; Misra, Orch. India. 313. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1546-47. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 16. 2012.

Limodorum flavum Bl., Bijdr. 8: 375. 1825.

Phaius maculatus Lindl., Gen. Sp. Orchid. Pl.: 127. 1831; Hook. f., Fl. Brit. India 5: 817. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 107, t. 149. 1898; Bruhl, Guide Orch. Sikkim. 78. 1926. [Plate 4.23. B]

Plant terrestrial herb, 43-115 cm tall. Pseudobulbs 8-15 × 2.8-8 cm, ovoid-ellipsoid to cylindrical. Leaves 4-7, 28-61 × 5-9.6 cm, ovate-lanceolate, acute, margins slightly undulate, petiolate. Inflorescence densely many-flowered; peduncle 13-24 cm long, sheathed; rachis 26-41 cm long, glabrous; pedicellate-ovary 2-2.7 cm long. Flowers 4.6-5.6 cm across, yellow; floral bracts ovate. Sepals subsimilar, 3-3.7 × 0.9-1.5 cm, spreading, concave; dorsal sepal 3.5-4.5 × 1.5-1.7 cm, oblong-elliptic, subspathulate, obtuse; lateral pair 3.5-3.7 × 1.6-1.7 cm, elliptic, obtuse, oblique to slightly falcate. Petals 2.9-3.8 × 0.9-1.3 cm, oblong-elliptic, spathulate, obtuse. Lip 2.5-2.9 × 1.5-3.2 cm, 3-lobed, yellow with orange or brown marking, spurred, erect; side lobes erect, enfolding the column; apical lobe ovate to suborbicular, slightly deflexed in front, edges crisped-undulate; disc with 3 prominent keels; spur straight. Column 1.8-2.2 × 0.6-0.67 cm, curved, hairy. Anther dome shaped; pollinia 8.

Flowering : March – May; Fruiting: April – June.
Specimen cited : Kalimpong 8th Mile 900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1036**, dt. 13. 04. 2010.
Status : Rare.
Local distribution : Kumsi, Mungpoo, Paiyung, 550 – 1600 m.
General distribution : India (North India, Sikkim, West Bengal); Bhutan, China, Japan, Laos, Malaysia, Myanmar, Nepal, New Guinea, Philippines, South-West Pacific Islands, Thailand, Vietnam.

Phaius mishmensis (Lindl. & Paxt.) Rchb. f., Bonplandia 5: 43. 1857; Hook. f., Fl. Brit. India 5: 817. 1890; King & Pantl., Orch. Sikkim Himal. 109, t. 152. 1898; Bruhl, Guide Orch. Sikkim. 78. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Hedge, Orch. Arun. Pradh. 46. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 583. 1998; Bose *et al.* Orch. India. 386. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 303. 2002; M. Pradhan, 100 N.E. Indian Orch. 80-81. 2006; Lucksom, Orch. Sikkim N.E. Himal. 432. t. 460, pl. 17. 2007; Misra, Orch. India. 313. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1547. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 16. 2012.

Limatodes mishmensis Lindl. & Paxt., Paxt.'s fl. Gard.3: 36. 1852. [Fig. 4.12]

Plant terrestrial herb, 38-120 cm tall. Pseudobulbs 3-6.7 × 1.2-1.9 cm, narrowly fusiform-cylindrical. Leaves 6-8, 15-35 × 5.7-11 cm, elliptic-lanceolate, acute, petiolate. Inflorescence 1 or 2, arise from leaf axils, 26-63 cm long, laxly few-flowered; peduncle 22-37 cm long; rachis 8-23 cm long, zigzag; pedicellate-ovary 1.8-3 cm long. Flowers 4-5.6 cm across; pale-pink; floral bracts caduceous. Sepals similar, 2.6-3.2 × 0.7-1.1 cm, linear-oblong, subacute. Petals 2.7-3 × 0.5-0.6 cm, linear-oblong, acute. Lip 2.7-3.6 × 1.5-2.9 cm, 3-lobed, white to pink, jointed

at base of column, spurred; side lobes rounded, enfolding the column; apical lobe entire, reflexed, emarginated; disc with a central thickened, hirsute- hairy ridge from base to tip. Column 1.7-2 × 0.7-1.4 cm long, straight. Anther hairy; pollinia 8.

Flowering : August – October; Fruiting: September – November.
Specimen cited : Takdah forest 1700 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1462**, dt. 19. 09. 2010.
Status : Rare.
Local distribution : Maneybhanjang, Kafer, Dilaram, 1100 – 2700 m.
General distribution : India (North East India, Sikkim, West Bengal);
Bhutan, China, Laos, Myanmar, Philippines,
Thailand, Vietnam.

Phaius tankervilleae (Banks ex l'Herit.) Bl., Mus. Bot. 2: 177. 1856; Tuyama in Hara, Fl. E. Himal. 2: 193. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Hedge, Orch. Arun. Pradh. 46. 1984; Deva & Naithani, Orch. N.W. Himal. 329. t. 328. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 106. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 583 1998; Bose *et al.* Orch. India. 388. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 305-306. 2002; M. Pradhan, 100 N.E. Indian Orch. 82-83. 2006; Lucksom, Orch. Sikkim N.E. Himal. 433-434. t. 463, pl. 18. 2007; Misra, Orch. India. 313. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1547. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 16. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 256. 2013; Misra, Orch. Odisha. 108-109. 2014.

Limodorum tankervilleae Banks ex l'Herit., Sert. Angl.: 28. 1789.

Phaius veratrifolius Wall. ex Lindl., *loc. cit.* 1831.

P. wallichii Lindl., Wall., Pl. Asiat. Rar. 2: 46, t.158. 1831; Hook. f., Fl. Brit. India 5: 816. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 108, t. 150. 1898; Bruhl, Guide Orch. Sikkim. 78. 1926.

P. blumei var. *assamica* Rehb. f., Gard. Chron. n.s. 17: 558. 1882.

P. blumei var. *pulchra* King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 109, t.151. 1898.

Plant terrestrial herb, 44-97 cm tall. Pseudobulbs 3.5-7 cm long, conical to ovoid, sheathed. Leaves 4-5, 30-76 × 9-17 cm, elliptic-lanceolate, acuminate, petiolate. Inflorescence 25-94 cm tall, laxly 6 to 16-flowered; peduncle 29-46 cm tall; rachis 16 cm long; pedicellate-ovary 2.5-4.5 cm long. Flowers 10-13 cm across, brownish-purple; floral bracts caduceous. Sepals and petals similar, white, pale yellow, greenish on outer surface, reddish to yellow-brown within spreading, lanceolate to oblanceolate, acuminate. Dorsal sepal 4.4-6.5 × 1.5-1.9 cm, lateral pair 4.4-6.7 × 1.3-1.7 cm. Petals 4-6.5 × 1.3-1.7 cm. Lip 3.9-6 × 2-4.3 cm, 3-lobed, spurred, pink to red, or creamy-yellow, obovate, acute, margin erose-undulate, recurved; callus obscurely 3-ridged. Column 1.9-2.3 cm long, clavate. Anther white; pollinia 8.

Flowering : March – May; Fruiting: April – June.

Specimen cited	: Pudung Busty 800 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0811 , dt. 10. 04. 2009.
Status	: Cultivated.
Local distribution	: Samalbung, Sinjee, Nimbong, Primtam, Pedong, Kurseong, Mirik, Seokbir khani, Sittong, Peshok, Mangmaya, 600 – 1700 m.
General distribution	: India (Sikkim, West Bengal); Australia, Bhutan, China, Indonesia, Japan, Malaysia, Myanmar, New Guinea, Pacific Islands and Sri Lanka.

Subtribe **Collabiinae** Schltr.

Chrysoglossum Bl.

Plants terrestrial herbs with pseudobulbs. Leaf solitary, elliptic-lanceolate, petiolate. Inflorescence erect, few-flowered. Flowers resupinate, widely open, spreading. Sepals subequal, spreading; lateral pair connate into a mentum with the base of the lip. Petals equal, slightly broader than the sepals. Lip mobile, 3-lobed, fleshy, clawed; lateral lamellae 2, median lamellae high between the side lobes. Column erect, winged; column foot distinct. Anther 2-celled, triangular; pollinia 2.

The genus *Chrysoglossum* Bl., comprises 4 species distributed in North East India, Sri Lanka, China, Thailand, Cambodia, Taiwan, Malaysia, the Malay Archipelago, New Guinea and the Pacific Islands.

Chrysoglossum ornatum Bl., Bijdr.: 338. 1825; Pearce & Cribb, Fl. Bhutan, 3(3): 308 & 310, t. 309. 2002; M. Pradhan, 100 N.E. Indian Orch. 76-77. 2006; Lucksom, Orch. Sikkim N.E. Himal. 435-436. t. 465. 2007; Misra, Orch. India. 287. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 9. 2012.

Ania maculata Thwaites, Enum. Pl. Zeyl: 301. 1861.

Chrysoglossum erraticum Hook. f., Fl. Brit. India 5(2): 784. 1890; Icon. Pl. 21: t.2062. 1892; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 97, t. 135. 1898; Bruhl, Guide Orch. Sikkim. 73. 1926; Hedge, Orch. Arun. Pradh. 41. 1984; Pradhan, Indian Orch. Guide Identif. Cult. 2: 239. 1979; Banerji, Orch. Nepal. 48. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 197. 1998; Bose *et al.* Orch. India. 147. 1999.

C. maculatum (Thwaites) Hook. f., *loc. cit.* 784. 1890.

Tainia maculata (Thwaites) Hook. f., *op. cit.* 821. 1890.

Plant terrestrial herb, 26-43 cm tall. Pseudobulbs 3-5.5 × 2-3 cm, ovoid to tapering, terete. Leaf solitary, 16-31 × 5-8 cm, lanceolate, acuminate, petiolate. Inflorescence 10 to 14-flowered; peduncle 13-23 cm long, sheathed; rachis 13-17 cm long,

glabrous; pedicellate-ovary 0.8-1.6 × 0.1-0.25 cm. Flowers 1.7-2 cm long, greenish-white; floral bracts lanceolate. Sepals and petals green. Dorsal sepal 1.2-1.7 × 0.2-0.4 cm, linear-lanceolate, acute; lateral pair 1.1-1.6 × 0.2-0.4 cm, narrowly triangular to lanceolate, slightly falcate, acute. Petals 1.1-1.5 × 0.3-0.5 cm, lanceolate, slightly falcate, acute. Lip 0.9-1.1 cm long, 3-lobed, white, fleshy, clawed; side lobes rounded, entire; apical lobe obovate, margins incurved to inrolled; disc 3-lamellate, fleshy, undulate. Column 6-8 × 1-1.3 mm, slender to stout; foot short. Anther apiculate; pollinia 2.

Flowering : May – July; Fruiting: June – August.
 Specimen cited : Charkhol forest 1600 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0877**, dt. 06. 06. 2009.
 Status : Rare.
 Local distribution : Manaybhanjang, Takdah, Gumbadara, 1500 – 2200 m.
 General distribution : India (Sikkim, West Bengal); Cambodia, Malay Archipelago, Taiwan, Thailand and Sri Lanka.

Nephelaphyllum Bl.

Plants terrestrial creeping herb. Succulent stems or pseudobulbs slender, fusiform, scarcely distinct from the short petioles. Leaf fleshy, ovate or cordate. Inflorescence terminal or from base of pseudobulb, laxly or densely few-flowered. Flowers small to medium in size, non-resupinate. Sepals and petals subequal, acute, often reflexed. Lip entire to 3-lobed, spurred; disc lamellate. Column 2 winged. Anther 2-celled; pollinia 8.

The genus *Nephelaphyllum* Bl., comprises about 16 species distributed in North East India, through South East Asia to Indonesia.

Key to the species

1. Sepals and petals not reflexed; lip 3-lobed; *N. cordifolium*
- 1a. Sepals and petals reflexed; lip simple..... *N. pulchrum*
var. *sikkimensis*

Nephelaphyllum cordifolium (Lindl.) Bl., Fl. Javae nov. ser. 1: t.61.3 1858; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 76. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 244. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 74. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 314, t. 315. 2002; Lucksom, Orch. Sikkim N.E. Himal. 398-399. t. 410, pl. 15.

2007; Mishra, Orch. India. 308. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 13. 2012; *et* 14(8): 12 – 20. 2013.
Cytheris cordifolia Lindl., Gen. Sp. Orchid. Pl.: 129. 1831.
Tainia cordifolia (Lindl.) Gagnep., Bull. Mus. Natl. Hist. Nat. ser.2, 4: 706. 1932.
 [Fig. 4.13]

Plant terrestrial, rhizomatous herb, 19-36 cm tall. Pseudobulbs 5.8-7.5 cm long, elongate. Leaves 3-5, 6-16 × 4.5-8.5 cm, ovate-cordate, acute, petiolate. Inflorescence terminal, 8-18 cm long, laxly 5 to 10-flowered; peduncle 5-8 cm long, sheathed; rachis glabrous, 4-6 cm long; pedicellate-ovary 8-9 mm long. Flowers 1.5-2.1 cm across, greenish-purple; floral bracts caduceus. Sepals subequal, 1.2-1.4 × 0.2-0.4 cm, free, narrowly oblong, acute, spreading to recurved. Petals 1.2-1.3 × 0.2-0.3 cm, narrowly oblong, acute, gibbous at base. Lip 1.8-2 × 0.7-0.8 cm, 3-lobed, elongate to wedge-shaped, spurred; side lobes narrow, diverging, margins erose; apical lobe broad, retuse; disc with 3 undulate lamellae. Column 3.7-4 mm long. Anther 2-celled; pollinia 8.

Flowering : June – August; Fruiting: July – September.
 Specimen cited : Damsang forest 1600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1221**, dt. 10. 06. 2010.
 Status : Threatened.
 Local distribution : Munsong, Neol forest, 800 – 1600 m.
 General distribution : India (North East India, Sikkim, West Bengal); Bangladesh.

Nephelaphyllum pulchrum Bl., Bijdr.: 373, t.36. 1825; Hook. f., Fl. Brit. India 5: 819. 1890; Hedge & A.N. Rao, Indian. J. Forestry 10(3): 195. 1987; Bruhl, Guide Orch. Sikkim. 77. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 244. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 96. 1997; Pearce & Cribb, Fl. Bhutan, 3(3): 314 & 316. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 88-89. 2005; *et* 100 N.E. Indian Orch. 78-79. 2006; Lucksom, Orch. Sikkim N.E. Himal. 399. t. 411, pl. 15. 2007; Mishra, Orch. India. 308. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 13. 2012; *et* 14(8): 12 – 20. 2013.
Nephelaphyllum latilabre Ridl., Trans. Linn. Soc. London 2(4): 238. 1894.
N. borneense Schltr., Bull. Herb. Boissier ser 2, 6: 301. 1906.
Tainia pulchra (Bl.) Gagnep., Bull. Mus. Natl. Hist. Nat. ser. 2, 4: 706. 1932.
T. borneensis (Schltr.) Gagnep., loc. cit. 1932.
T. latilabra (Ridl.) Gagnep., loc. cit. 1932.
 var. *sikkimensis* Hook. f., Fl. Brit. India 5(2): 819. 1890.
Nephelaphyllum sikkimensis (Hook. f.) S. Karthikeyan, Fl. Ind. Enumerate. Monocot.: 154. 1989; Chowdhery, Orch. Fl. Arun. Pradh. 525. 1998; Bose *et al.* Orch. India. 338. 1999.
 var. *sikkimensis* Hook. f., Fl. Brit. India 5(2): 819. 1890.

Nephelaphyllum sikkimensis (Hook. f.) S. Karthikeyan, Fl. Ind. Enumerate.- Monocot.: 154. 1989. [Fig. 4.14]

Plants terrestrial herb, 9-15 cm tall. Pseudobulbs 1.6-3.4 × 0.3-0.5 cm, ovoid-cylindric, sheathed. Leaf solitary, 7.3-11 × 3.6-5.9 cm, broadly ovate-lanceolate, fleshy, upper surface brownish-green mottled with purple, lower surface deep purple, petiolate. Inflorescence 7-10 cm long, arises from pseudobulb base, 4 to 5-flowered; peduncle 5-6 cm long; rachis 3-4 cm, fleshy; pedicellate-ovary 0.7-0.9 cm long. Flowers 2.1-2.5 cm long, yellowish-purple; floral bracts ovate-lanceolate. Sepals and petals pale-green, reflexed. Sepals linear-oblong, acute, margins crenulate. Dorsal sepal 12-14 × 2-3 mm. Lateral pair 13-15 × 2-3 mm. Petals 11-12 × 2.5-2.7 mm, linear-oblong, acute. Lip 1.8 × 1 cm, simple, broadly oblong, emarginated, margins minutely crenulate, spurred; disc with a thickened band expanding into 3-dentate ridges at apex; spur 2-lobed, clavate. Column 0.7-0.5 cm, narrowly winged. Anther pale; pollinia yellow.

Flowering : June – August; Fruiting: July – September.
Specimen cited : Relli River sides near Primtam Busty 600 m,
Rajendra Yonzone, D. Lama and R. B. Bhujel
1246, dt. 20. 06. 2010.
Status : Threatened.
Local distribution : Sepkhola, Tarkhola, 500 – 1200 m.
General distribution : India (Sikkim, West Bengal).

Tainia Bl.

Plants terrestrial herbs, creeping. Pseudobulb of a single internode, erect, cylindric to ovoid. Leaf solitary, elliptic to ovate, petiolate. Inflorescence terminal or lateral; peduncle sheaths tubular, acute; floral bracts triangular. Flowers resupinate, opening simultaneously. Sepals and petals triangular to ovate-elliptic; lateral pair slightly decurrent along column foot. Lip 3-lobed, spurless. Column semiterete, foot distinct. Anther with 2 crests (abaxially); pollinia 8.

The genus *Tainia* Bl., comprises 14 species distributed in India, Myanmar, China, Japan, Thailand, Vietnam, the Malay Archipelago to Australia and Bougainville.

Key to the species

1. Pseudobulb ovoid*T. penangiana*
- 1a. Pseudobulb cylindric.....2

2. Leaf cordate; flower 2.5-3 cm across,
pale greenish-brown.....***T. megalantha***
2a. Leaf elliptic; flower 1.5-2.5 cm across, pale green***T. minor***

Tainia megalantha Tang & Wang, Acta Phytotax. Sin.1: 76. 1951; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Pearce & Cribb, Fl. Bhutan, 3(3): 312, t.313. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 86-87. 2005; Lucksom, Orch. Sikkim N.E. Himal. 397-398. t. 409, pl. 15. 2007; Misra, Orch. India. 307. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 13. 2012.

Ipea wrayana Hook. f., Fl. Brit. India 5: 812. 1890.

Nephelaphyllum grandiflorum Hook. f., Fl. Brit. India 6: 192. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 104, t.144. 1898; Bruhl, Guide Orch. Sikkim. 76. 1926.

Mischobulbum grandiflorum sensu Rolfe, Orchid Rev. 20: 127. 1912, *non* (Hook. f.) Schltr.

Tainia wrayana (Hook. f.) J.J. Sm., Bull. Jard. Bot. Brit. Ser. 2(8): 6. 1912; Hedge & A.N. Rao, J. Econ. Tax. Bot. 4:389. 1983; Bose *et al.* Orch. India. 445. 1999.

Mischobulbum wrayanum (Hook. f.) Rolfe, S. Kumar & Manilal, Kew Bull. 42: 942. 1987; Chowdhery, Orch. Fl. Arun. Pradh. 515. 1998. [Plate 4.22. D]

Plant terrestrial herb, 22-34 cm tall. Pseudobulbs 4-7 × 0.3-1 cm, erect, cylindrical. Leaf solitary, 8-15 × 5-10 cm, cordate, acuminate, margin entire, mottled or marbled. Inflorescence erect, 4 to 8-flowered; peduncle 11-18 cm long, sheathed, glabrous; rachis 5-11 cm long; pedicellate-ovary 0.8-1.2 cm long. Flowers 2.5-3 cm across, pale greenish brown; floral bracts lanceolate; sepals and petals pale greenish-brown with dark brown nerved. Dorsal sepal 1.5-1.7 × 0.3-0.6 cm, elliptic, acute; lateral pair 1.8-2 × 0.6-0.8 cm, lanceolate, slightly falcate, acute, base broad. Petals 1.3-1.6 × 0.5-0.7 cm, obliquely elliptic, subacute. Lip 1.6-1.8 cm long, pale-cream with pink spots, elliptic, entire, glabrous, 3-lamellae, central lamellae raised. Column 6.7-9 mm long, clavate, margin slightly denticulate, winged; foot short. Anther compressed; pollinia 8.

Flowering	: March – April; Fruiting: April – June.
Specimen cited	: Kalijhora forest 400 m, Rajendra Yonzon, D. Lama and R. B. Bhujel 1076 , dt. 14. 03. 2010.
Status	: Threatened.
Local distribution	: Latpanjar, Kumai, Jholung, 250 – 700 m.
General distribution	: India (North East India).

Tainia minor Hook. f., Fl. Brit. India 5(2): 821. 1890; Icon. Pl. 21: t.2091. 1892; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 102, t.141. 1898; Bruhl, Guide Orch. Sikkim. 76. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 241. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 661. 1998; Bose *et al.* Orch. India. 443. 1999;

Pearce & Cribb, Fl. Bhutan, 3(3): 318. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 94-95. 2005; Lucksom, Orch. Sikkim N.E. Himal. 401-402. t. 414, pl. 15. 2007; Misra, Orch. India. 317. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1548. 2012 *et* McAllen Int. Orch. Soc. J., 13(4): 19. 2012. [Plate 4.23. D]

Plant terrestrial herb, 23-37 cm tall. Pseudobulbs 3.3-6.8 × 0.8-1.2 cm, cylindrical, expanded at base. Leaf solitary, 14-24 × 3.4-5.8 cm, elliptic, acuminate, thin, petiolate. Inflorescence terminal, 5 to 14-flowered; peduncle 12-22 cm long, sheathed; rachis 7-11 cm long; pedicellate-ovary 0.7-1.1 cm long. Flowers 1.5-2.5 cm across, pale-green; floral bracts triangular. Sepals and petals pale-green with purple nerved. Dorsal sepal 1.2-1.7 × 0.2-0.3 cm, elliptic-ovate, obtuse to subacute; lateral pair 1.2-1.6 × 0.2-0.3 cm, elliptic, falcate, obtuse to subacute. Petals 1.2-1.4 × 0.2-0.3 cm, obliquely elliptic to obovate, slightly falcate, obtuse. Lip 1-1.3 × 0.7-0.9 cm, 3-lobed, yellow, elliptic; side lobes obliquely triangular, slightly falcate, obtuse; apical lobe wedge-shaped, margins entire, glabrous; callus with 5-lamellae. Column 7.2-9 mm long, winged; foot short. Anther dark-purple; pollinia 8.

Flowering : May – June; Fruiting: June – July.
 Specimen cited : Baggonra forest 2000 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0851**, dt. 12. 05. 2009.
 Status : Common.
 Local distribution : Mem Tea Estate, Lopchu, Sukiapokhari, Toroyok, Rambi forest, Lava, Algarah, Baggonra, 1700–2300 m.
 General distribution : India (North East India, Sikkim, West Bengal); China, Myanmar.

Tainia penangiana Hook. f., Fl. Brit. India 5 (2): 820. 1890; *et* McAllen Int. Orch. Soc. J., 13(4): 8. 2012.

Ania penangiana (Hook. f.) Summerh., Bot. Mag. 161: t.9553. 1939; Pearce & Cribb, Fl. Bhutan, 3(3): 277, t. 278. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 72-73. 2005; Lucksom, Orch. Sikkim N.E. Himal. 400. t. 412, pl. 15. 2007; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012.

T. hookeriana King & Pantl., J. Asiat. Soc. Bengal 64(3): 336. 1896; Bruhl, Guide Orch. Sikkim. 75. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 242. 1979; Bose *et al.* Orch. India. 443. 1999; Misra, Orch. Odisha. 102-103. 2014.

Ascotainia hookeriana (King & Pantl.) Ridl., Mat. Fl. Malay. Penins. 1: 116. 1907.

A. penangiana (Hook. f.) Ridl., loc. cit. 1907.

Ania hookeriana (King & Pantl.) Tang & Wang *ex* Summerh., Bot. Mag. 161: t. 9553. 1939; Chowdhery, Orch. Fl. Arun. Pradh. 55. 1998.

Plant terrestrial herb, 38-56 cm tall. Pseudobulbs 3.2-5.5 × 2.7-4 cm, ovoid. Leaf solitary, 30-51 × 4.3-9 cm, elliptic, acuminate, margins entire. Inflorescence laxly 4 to 13-flowered; peduncle 20-34 cm long, glabrous, bracteate; rachis 9-31 cm long; pedicellate-ovary 1.8-2.3 cm long. Flowers 1.7-2 cm across, pale-green with reddish-

purple streaks; floral bracts lanceolate. Dorsal sepal 2-3.2 × 0.5-0.7 cm, elliptic, acute to acuminate; lateral pair 2-3.1 × 0.5-0.6 cm, elliptic, straight to falcate, acute. Petals 2-3.1 × 0.5-0.6 cm, obliquely elliptic, slightly falcate, acute to acuminate. Lip 1.5-1.8 × 0.8-1.3 cm, white with yellow 3-lamellae and pink spots, spurred, 3-lobed, elliptic to obovate; side lobes obliquely triangular, slightly falcate; apical lobe rhombic to orbicular, tip acuminate, margins entire, slightly undulate, glabrous; spur 2-4 mm long. Column 0.8-1 cm long. Anther dome shaped with 2 purple spots; pollinia 8.

Flowering	: February – March; Fruiting: March – May.
Specimen cited	: Algarah forest 1780 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0772 , dt. 26. 02. 2009.
Status	: Sparse.
Local distribution	: Lopchu, Samalbong, Sinjee, Lopchu, Seokbir Khani, Nimbong, 700 – 1700 m.
General distribution	: India (North East India, Sikkim, West Bengal); China, Myanmar, Peninsula, Thailand, Vietnam.

Tribe **Coelogyneae**

Subtribe **Arundinae**

Arundina Bl.

Plants perennial terrestrial herbs. Stems stout, slender, erect. Leaves numerous, grasslike, distichous, sheaths overlapping. Inflorescence terminal, racemose or paniculate, flowers opening in succession, one or two at a time. Flowers resupinate, large and showy. Sepals free, subequal, spreading, narrow; dorsal sepal erect; lateral pair close together behind lip. Petals free, spreading, broad. Lip not spurred, trumpet-shaped; side lobes enclosing the column; tip emarginated; disc 3-lamellae. Column long, slender, foot absent. Anther 1; pollinia 8.

The genus *Arundina* Bl., comprises up to 5 species distributed in Sri Lanka, India, South East Asia, China, Malaysia and the adjacent Islands.

Arundina graminifolia (D. Don) Hochr., Bull. New York Bot. Gard. 6: 270. 1910; Tuyama in Hara, Fl. E. Himal. 1: 425. 1966; Tuyama in Hara, Fl. E. Himal. 2: 177. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Banerji, Orch. Nepal. 35. 1982; Hedge, Orch. Arun. Pradh. 56. 1984; Deva & Naithani, Orch. N.W. Himal. 199 – 200 t. 198. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 34. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 74. 1998; Bose *et al.* Orch. India. 101. 1999; Pearce & Cribb,

Fl. Bhutan, 3(3): 319-321, 320. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 98-99. 2005; *et* 100 N.E. Indian Orch. 86-87. 2006; Lucksom, Orch. Sikkim N.E. Himal. 434-435. t. 464, pl. 18. 2007; Misra, Orch. India. 281. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* McAllen Int. Orch. Soc. J., 13(4): 8. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 92. 2013.

Cymbidium bambusifolium Roxb., Hort. Beng.: 63 (181, nom. nud.: Fl. Ind. ed. 1832: 460. 1832.

Bletia graminifolia D. Don, Prodr. Fl. Nepal: 29. 1825.

Arundina chinensis Bl., op. cit. 402. 1825. Hook. f., Fl. Brit. India 5: 857. 1890.

Limodorum graminifolium Buch.-Ham. *ex* D. Don, Prodr. Fl. Nepal.: 30. 1825.

Arundina bambusifolia (Roxb.) Lindl., Gen. Sp. Orchid. Pl.: 125. 1831; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 113, t. 156. 1898; Bruhl, Guide Orch. Sikkim. 80. 1926.

A. minor Lindl., loc. cit. 1831.

A. densa Lindl., Bot. Reg. 28: misc.25, no.26. 1842.

A. affinis Griff., Not. Pl. Asiat. 3: 330. 1851.

A. philippi Rchb. f., Linnaea 25: 227. 1852.

A. pulchra Miquel, J. Bot. Neerl. 1:90. 1861.

Plant terrestrial herb, 85-135 cm tall. Stem erect, cane-like, leafy throughout. Leaves many, 9-25 × 1.4-2.7 cm, sessile, distichous, linear-lanceolate, acuminate. Inflorescence erect, racemes or paniculate, few to many-flowered; peduncle and rachis glabrous; pedicellate-ovary 2.8-3.2 cm long. Flowers 4 × 6 cm across, pinkish-purple; floral bracts lanceolate. Sepals similar, 3.9-4.8 × 0.8-1.3 cm, pinkish-purple, narrowly ovate to ovate-lanceolate, acute. Petals 4-4.7 × 1.8-2.2 cm, broadly elliptic, obtuse. Lip 5-5.8 × 2.5-3.7 cm, 3-lobed; side lobes enfolding column, semi-ovate; apical lobe recurved, 2-lobed in front, margins crenulate; disc with 3 parallel lamellae. Column 2-2.3 cm long, slender, erect. Anther dome shaped; pollinia 8.

Flowering : January – November; Fruiting: March – February.

Specimen cited : Dello Hill 1460 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0094**, dt. 18. 08. 2007.

Status : Common.

Local distribution : Relli, Kumsi, Teesta River Valley, Sineybong, Chuikhim, Yangmakum, Algarah, Kalimpong 8th Mile 300 – 1800 m.

General distribution : India (North West India, North East India, South India, Sikkim, West Bengal); Bangladesh, Bhutan, China, Indonesia, Malaysia, Myanmar, Nepal, Pacific Islands, South East Asia and Sri Lanka.

Subtribe **Thuniinae**

Thunia Rchb. f.

Plants epiphytic or terrestrial herbs, medium to large, lacking pseudobulbs. Stems fasciculate, erect, biennial, sheathed below and leafy above. Leaves distichous, sessile below. Inflorescence terminal, on young leafy shoots, racemes; floral bracts large, spathe-like, persistent. Flowers short-lived, large, showy. Sepals and petals subsimilar, free. Lip entire, spurred, fringed on front margin; disc with 5-7 lamellae or fringes; spur short, obtuse. Column slender, semi-terete at tip, 2-winged. Anther 1; pollinia 8.

The genus *Thunia* Rchb. f., comprises about 6 species distributed in India, China and South East Asia.

Key to the species

1. Floral lip with a patch of yellow..... *T. alba* var. *alba*

1a. Floral lip white with purple lines*T. alba* var. *bracteata*

Thunia alba (Lindl.) Rchb. f., Bot. Zeitung (Berlin) 10: 764. 1852; Hara *et al.*, Enum. Fl. Pl. Nepal 1: 57. 1978; Pradhan, Indian Orch. Guide Identif. Cult. 2: 439. 1979; Banerji, Orch. Nepal. 44. 1982; Hedge, Orch. Arun. Pradh. 56. 1984; Deva & Naithani, Orch. N.W. Himal. 341. t. 340. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 666. 1998; Bose *et al.* Orch. India. 448. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 321, t. 322. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 96-97. 2005; *et* 100 N.E. Indian Orch. 84-85. 2006; Lucksom, Orch. Sikkim N.E. Himal. 437. t. 467, pl. 18. 2007; Misra, Orch. India. 318. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1548. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 286. 2013.

Phaius albus Lindl., Wall., Pl. Asiat. Rar. 2:85, t.198. 1831; Hook. f., Fl. Brit. India 5: 818. 1890; Bruhl, Guide Orch. Sikkim. 79. 1926.

var. *alba*

Plant epiphytic herb, 37-68 cm tall. Stem erect, sheathed. Leaves many, 12-27 × 3-4.8 cm, narrowly elliptic-lanceolate, acuminate, glaucous beneath. Inflorescence pendent, 4 to 7-flowered; peduncle 2-6 cm long, sheathed; rachis 2-4 cm long; pedicellate-ovary 3-3.7 cm long. Flowers 4-5 cm long, white; floral bracts oblong. Sepals and petals white. Sepals free, subequal, narrowly oblong-ovate, acute. Dorsal sepal 5.5-6.6 × 1.4-1.8 cm; lateral pair 6.5-7.2 × 1.3-1.6 cm. Petals 5-6 × 1.4-1.5 cm, oblong, acute. Lip 4.6-5 × 2.5-3.5 cm, white with large yellow patch, spurred at base; basal half convolute into a tube; apical half hooded, margins dentate-undulate;

disc with 5 to 9 dentate-fimbriate ridges. Column 1.8-2 cm long, winged; foot short. Anther oblong-ovate; pollinia 8.

Flowering : June – August; Fruiting: July – September.
Specimen cited : Pudung Busty 800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0074**, dt. 05. 08. 2007.
Status : Rare
Local distribution : Suruk, Sendaybong, Dello Hill, Sittong, Dello hill, 600 – 1800 m.
General distribution : India (North East India, Sikkim, West Bengal); China, Bhutan, Malaysia, Myanmar, Nepal, Thailand.

Thunia alba var. *bracteata* (Roxb.) Pearce & Cribb, Edinb. J. Bot. 58(1): 116. 2001; Hook. f., Fl. Brit. India 5: 857. 1890; Pearce & Cribb, Fl. Bhutan, 3(3): 323 2002; Lucksom, Orch. Sikkim N.E. Himal. 437-438. t. 468, pl. 18. 2007.

Limodorum bracteatum Roxb., Hort. Bengal.: 63. 1814, *nom. nud.*; Fl. Ind. ed.1832(3): 466. 1932.

Thunia bracteata (Roxb.) Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 4: 205. 1919; Deva & Naithani, Orch. N.W. Himal. 341. 1986; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1549. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 288. 2013; Misra, Orch. Odisha. 256-257. 2014.

T. venosum Rolfe, Orchid Rev. 13: 206. 1905; Pradhan, Indian Orch. Guide Identif. Cult. 2: 438. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 121. 1997.

Plant epiphytic herb. Stem 33-75 cm long, sheathed. Leaves many, 14-26 × 1.5-3.8 cm, alternate, elliptic-lanceolate, acute, stem clasping sheaths. Inflorescence 5-11 cm long, terminal, drooping; peduncle 0.6-2.2 cm long, terete, smooth; rachis 1.3-5.8 cm long, 3-8 pedicellate drooping flowers; pedicellate-ovary ribbed, smooth. Flowers 4.5-7.4 cm across, white; floral bracts elliptic. Sepals sub-equal, white; Dorsal sepal 3.9-4.4 × 1.1-1.4 cm, elliptic-oblong, acute, arched over column; lateral pair 4-4.4 × 1-1.3 cm, oblong, acute, only half of the base is attached to the column to rest free. Petals 3.8-4.3 × 0.8-1 cm, white, elliptic-oblong, acute. Lip 2.9-3.5 × 2.5-2.7 cm, white with purple lines; slightly bifid horizontal spur; the anterior cucullate, forming a rounded shel-like mouth slightly acuminate and sharply and unequally dentate undulate edges, the upper surface with 5-dentate, mauve-purple, crested ridges and nerves. Column 1.1-1.4 × 0.7-0.8 cm, winged. Anther 2-chambered; pollinia 8.

Flowering : July – September; Fruiting: August – October.
Specimen cited : Kumsi forest 900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0933**. dt. 21. 08. 2009.
Status : Common.

- Local distribution : Hill Top, Dello Hill, Pudung, Samalbong, Seokbir khani, Sinjee, 900 – 1400 m.
- General distribution : India (North East India, Sikkim, West Bengal); Nepal.

Subtribe **Coelogyinae** Benth.

Coelogyne Lindl.

Plants perennial epiphytic rarely lithophytic herbs. Pseudobulbs ovoid, conical or cylindrical. Leaves 2, elliptic to lanceolate, plicate, usually petiolate. Inflorescence erect or pendent, 1 to many-flowered, racemes. Flowers resupinate, small to large and showy, opening simultaneously or one at a time. Floral bract large, deciduous. Sepals free, subequal, spreading, often concave. Petals free, usually narrower than the sepals. Lip sessile on the base of the column, 3-lobed, concave at base; side lobes erect on either side of the column; apical lobe spreading; disc keeled, lamellae often extending onto apical lobe. Column erect, straight or curved. Anther ventral at column apex; pollinia 4.

The genus *Coelogyne* Lindl., comprises over 100 species distributed in India, China, South East Asia, the Malay Archipelago and the Pacific Islands.

Key to the species

1. Flowers mostly opening successively.....2
 - 1a. Flowers mostly all opening at the same time
(except sometime in *C. barbata*).....3
2. Epichile of lip with additional keels *C. fimbriata*
 - 2a. Epichile of lip without additional keels *C. ovalis*
3. Peduncles naked at base but with distichous
glumes just below the racemes4
 - 3a. Peduncles not naked at base7
4. Lamellae 25
 - 4a. Lamellae 36
5. Inflorescence bears flowers successively year
after year; apex of rachis with distichous glumes *C. prolifera*
 - 5a. Inflorescence bears flowers only once;

- apex of rachis without distichous glumes *C. stricta*
6. Dorsal sepal 4.3-4.9 cm long; lip fimbriate, brown *C. barbata*
- 6a. Dorsal sepal 1.2-1.5 cm long; lip entire,
tinged with yellow *C. raizadae*
7. Peduncle either naked throughout or enveloped with
glumes by more than half at the base;
flowers pale yellowish-green *C. fuscescens*
- 7a. Peduncles imbricated with glumes throughout;
flowers white8
8. Inflorescence terminal9
- 8a. Inflorescence arising from the bas of pseudobulbs.....10
9. Side lobes of lip oblong-ovate, entire,
streaked with reddish-brown..... *C. punctulata*
- 9a. Side lobes of lip rounded, serrulate at apex;
4 large yellow eyes blotch with red on lip *C. corymbosa*
10. Lowest flowering bracts naked, rarely with sterile bracts
or glumes; lip with unbroken, undulate or crenulate lamellae11
- 10a. Lowest flowering bracts usually with few glumes
or one or more sterile bracts; lip with blotched,
laciniate, warty or with inconspicuous lamellae14
11. Pseudobulbs narrowly elliptic-oblong,
laterally compressed *C. pantlingii*
- 11a. Pseudobulbs ovoid-cylindric, grooved,
not laterally compressed.....12
12. Inflorescence 6-14 cm long, 2-6-flowered *C. viscosa*
- 12a. Inflorescence longer than 14 cm, more than 5-flowered.....13
13. Lip with yellow patches on the disc *C. flaccida*
- 13a. Lip without yellow patches on the disc *C. pempahesiana*
14. Blotches on the lip not bordered; lamellae
more or less laciniate or fimbriate *C. cristata*
- 14a. Blotches on the lip bordered; lamellae crenulate.....15
15. Pseudobulbs ovate-oblong to cylindric; leaves
narrowly oblong; inflorescence 4-8 flowered *C. nitida*
- 15a. Pseudobulbs obovoid or ellipsoid or turbinata;
leaves elliptic-oblong; inflorescence 3-5-flowered *C. occultata*

Coelogyne barbata Lindl. ex Griff., Itin. Pl. Khasyah Mts.: 72. 1848; Not. Pl. Asiat. 3: 280. 1851; Hook. f., Fl. Brit. India 5: 839. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 276. 1979; Hedge, Orch. Arun. Pradh. 47. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 49. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 216. 1998; Bose *et al.* Orch. India. 157. 1999; Clayton, Genus *Coelogyne*. 32-33. 2002; Pearce & Cribb, Fl. Bhutan, 3(3): 333, t. 334. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 102-103. 2005; Lucksom, Orch. Sikkim N.E. Himal. 480-481. t. 497, pl. 20. 2007; Misra, Orch. India. 288. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1539. 2012; *et Int. J. Pharm. Bio Sci.* 3(2): 510. 2012. [Plate 4.24. A]

Plant epiphytic, 28-47 cm tall, rhizomatous herb. Pseudobulbs 5.5-9.8 × 2.5-3.9 cm, clustered, ovoid to subglobose, sheathed. Leaves 2, 16-37 × 4.5-6.3 cm, oblong-lanceolate, acuminate, coriaceous, petiolate. Inflorescence 34-66 cm long, hysteranthous, 4 to 11-flowered; peduncle sheathed; rachis 11-25 cm long, zigzag; pedicellate-ovary 1.7-2 cm long. Flowers 5.6-8.2 cm across, white with dark-brown lip; floral bracts caduceus. Sepals and petals pure white. Dorsal sepal 4.3-4.9 × 1.6-2.2 cm, ovate-oblong, acute, margins reflexed, nerved; lateral pair 4.4-4.9 × 1.4-1.9 cm, ovate-oblong, acute, nerved. Petals 4.5-4.8 × 0.4-0.6 cm, linear-lanceolate, acute, apex reflexed. Lip 3-lobed, side lobes short, ovate, margins fimbriate; apical lobe triangular, margins with dense fimbriate projections; disc with 3-lamellae, fimbriate. Column 2.5-2.8 × 0.7-0.8 cm, stiff, winged hood. Pollinia 4.

Flowering : September – December; Fruiting: October – January.
 Specimen cited : Rachela forest 2950 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0715**, dt. 15. 10. 2008.
 Status : Rare.
 Local distribution : Todey, Tangta, Rimbick, Jalapahar, Manaybhanjang, 1600 – 2600 m.
 General distribution : India (North East India); Nepal, Bhutan, Myanmar, China.

Coelogyne corymbosa Lindl., Fol. Orchid. Coelogyne 5: 7, no. 16. 1854; Hook. f., Fl. Brit. India 5: 831. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 134, t. 185. 1898; Bruhl, Guide Orch. Sikkim. 93. 1926; Tuyama in Hara, Fl. E. Himal. 1: 428. 1966; Tuyama in Hara, Fl. E. Himal. 2: 181. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 273. 1979; Banerji, Orch. Nepal. 49. 1982; Hedge, Orch. Arun. Pradh. 47. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 50. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 216. 1998; Bose *et al.* Orch. India. 159. 1999; Clayton, Genus *Coelogyne*. 187-188. 2002; Pearce & Cribb, Fl. Bhutan, 3(3): 330. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 104-105. 2005; Lucksom, Orch. Sikkim N.E. Himal. 478-479. t. 494, pl. 19. 2007; Misra, Orch. India. 288. 2007; Yonzon *et al.*

Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012; *et* Int. J. Pharm. Bio Sci. 3(2): 510. 2012.

Pleione corymbosa (Lindl.) Kuntze, Revis, Gen. Pl. 2: 680. 1891.

Coelogyne taronensis Handel-Mazzetti, Anz. Akad. Wiss. Wien. Math.-Naturwiss. Kl. 59: 254. 1922. [Plate 4.8]

Plant epiphytic herb, 14-27 cm tall. Pseudobulbs 2.8-4.3 × 1.6-2 cm, clustered, ovoid to subrhomboid, sheathed. Leaves 2, 11-18 × 2.3-3.1 cm, erect, elliptic-lanceolate, acute, coriaceous, petiolate. Inflorescence synanthous or proteranthous, 2 to 5-flowered; peduncle 5-9 cm long; rachis 3-5 cm long, slender; pedicellate-ovary 2.8-3 cm long. Flowers 4-5.3 cm across, pure white, fragrant; floral bracts oblong-lanceolate. Sepals similar, 2.5-3.8 × 0.7-1 cm, lanceolate, acute, 1-nerved. Petals 2.5-3.3 × 0.4-0.8 cm, narrowly lanceolate, acute. Lip 2-2.5 × 1-1.3 cm, 3-lobed, 4 large yellow eyes blotch with red; side lobes rounded; apical lobe ovate, acute; disc 3-lamellae. Column 1.5-1.8 cm long, arcuate, winged. Anther ovate, obtuse; pollinia 4.

Flowering : April – May; Fruiting: May – July.

Specimen cited : Rimbick 2100 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0308**, dt. 11. 04. 2008.

Status : Frequent.

Local distribution : Tiger Hill, Manibhanjang, Samanden, Baggonra, Senchale, 1400 – 3300 m.

General distribution : India (North East India, Sikkim, West Bengal); Bhutan, China.

Coelogyne cristata Lindl., Coll. Bot.: *sub* t.33. 1821; Hook. f., Fl. Brit. India 5: 829. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 133, t. 184. 1898; Bruhl, Guide Orch. Sikkim. 94. 1926; Tuyama in Hara, Fl. E. Himal. 1: 429. 1966; Tuyama in Hara, Fl. E. Himal. 2: 181. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 274. 1979; Banerji, Orch. Nepal. 50. 1982; Deva & Naithani, Orch. N.W. Himal. 229 – 231. t. 230. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 51. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 216-219. 1998; Bose *et al.* Orch. India. 159. 1999; Clayton, Genus *Coelogyne*. 173. 2002; Pearce & Cribb, Fl. Bhutan, 3(3): 332-333. 2002; Lucksom, Orch. Sikkim N.E. Himal. 475-476. t. 490, pl. 19. 2007; Misra, Orch. India. 288. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012; *et* Int. J. Pharm. Bio Sci. 3(2): 510. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 116. 2013.

Cymbidium speciosissimum D. Don, Prodr. Fl. Nepal.: 35. 1825.

Plant epiphytic or lithophytic, rhizomatous herb, 20-46 cm tall. Pseudobulbs 5-8 × 1-1.4 cm, cylindrical-ovoid, smooth. Leaves 2, 13-28 × 2.2-3 cm, linear-lanceolate, acute, margins slightly undulate. Inflorescence heteranthous, drooping, 5 to 10-flowered; pedicellate-ovary 2.5-3.5 cm long. Flowers 5-8 cm across, pure white; floral bracts oblong-lanceolate. Sepals and petals white. Sepals similar, 4.5-5.4 ×

1.4-1.7 cm, narrowly elliptic-oblong, subacute, undulate. Petals 4.3-5.2 × 0.9-1.3 cm, narrowly elliptic-oblong, acute, undulate. Lip 4-4.9 × 3.3-3.6 cm, 3-lobed, white with yellow; side lobes large, rounded; apical lobe suborbicular; disc with 4 or 5 fimbriate lamellae. Column arcuate, winged. Anther oblong-ovate, white; pollinia 4.

Flowering : February – May; Fruiting: March – September.
Specimen cited : Lava forest 2300 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0217**, dt. 11. 03. 2008.
Status : Common.
Local distribution : Todey-Tangta, Algarah, Damsang Gari, Kafer, Birch Hill, Mamring, Chimney, Lopchu, Rambi forest, Manaybhanjang, Neora Valley, 1200–2800 m.
General distribution : India (North East India, Sikkim, West Bengal); Bhutan, Nepal, Tibet, China.

Coelogyne fimbriata Lindl., Bot. Reg. 11: t.868. 1825; Hook. f., Fl. Brit. India 5: 836. 1890; Chowdhery, Orch. Fl. Arun. Pradh. 219. 1998; Bose *et al.* Orch. India. 159. 1999; Clayton, Genus Coelogyne. 51-52. 2002; Pearce & Cribb, Fl. Bhutan, 3(3): 326-327. 2002; Lucksom, Orch. Sikkim N.E. Himal. 472-473. t. 486, pl. 18. 2007; Misra, Orch. India. 288. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1539. 2012; *et Int. J. Pharm. Bio Sci.* 3(2): 510. 2012.

Pleione chinensis Kuntze, Revis. Gen. Pl. 2: 680. 1891.

P. fimbriata (Lindl.) Kuntze, Rev. Gen. Bot. 2: 680. 1891.

Coelogyne ovalis sensu Pfitz. & Kranz., Pflanzenr. (IV. 50) Coelog.: 53, t.17d,e. 1907, *non* Lindl. 1838.

C. laotica Gagnep., Bull. Mus. Hist. Nat. Paris, ser. 2, 2: 425. 1930.

C. xerophyta Hand-Mazz., Symb. Sin. 7: 1346. 1936.

C. leungiana S.Y. Hu, Quart. J. Taiwan Mus. 25 (3-4): 223. 1972.

C. primulina Barretto, Orchid Rev. 98. 1156: 37-43. 1990.

Plant epiphytic, rhizomatous herb, 11-28 cm tall. Pseudobulbs 2.8-7.8 × 0.8-1.3 cm, ovoid to ellipsoid. Leaves 2, 7.3-16 × 1.5-2.6 cm, oblong-elliptic, acute, petiolate. Inflorescence hysteranthous, 1 to few-flowered; peduncle 2.1-2.4 cm long; rachis 3-6.7 cm long, zigzag; pedicellate-ovary slender. Flowers 2.9-3.6 cm across, pale-green; floral bracts caduceus. Sepals and petals pale-green; dorsal sepals 2-2.2 × 0.7-0.9 cm, lanceolate, acute; lateral pair 2-2.5 × 0.7-0.8 cm, oblique, lanceolate, acute. Petals 1.7-2 × 0.1-0.2 cm, filiform. Lip 1.9-2.2 × 1.2-1.5 cm, 3-lobed, pale yellow with dark brown; side lobes oblong-elliptic, obtuse, margins fimbriate; apical lobe orbicular, margins fimbriate; disc with 3-lamellae. Column 1.3-1.5 × 0.4-0.6 cm long, winged.

Flowering : September – November; Fruiting: October – December.

Specimen cited : Relli – Pala Busty 800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1501**, dt. 17. 10. 2010.
 Status : Common.
 Local distribution : Kumsi, Mungpoo, Mirik, Munsong, Nimbong, Mungpoo, 800 – 2300 m.
 General distribution : India (North East India, Sikkim, West Bengal); Bhutan, China, Myanmar.

Coelogyne flaccida Lindl., Gen. Sp. Orchid. Pl.: 39. 1830; Hook. f., Fl. Brit. India 5: 829. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 133, t. 183. 1898; Bruhl, Guide Orch. Sikkim. 95. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 269. 1979; Banerji, Orch. Nepal. 50. 1982; Hedge, Orch. Arun. Pradh. 48. 1984; Deva & Naithani, Orch. N.W. Himal. 231. t. 232. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 219. 1998; Bose *et al.* Orch. India. 159. 1999; Clayton, Genus *Coelogyne*. 211-212. 2002; Pearce & Cribb, Fl. Bhutan, 3(3): 329. 2002; Lucksom, Orch. Sikkim N.E. Himal. 475. t. 489, pl. 19. 2007; Misra, Orch. India. 288. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012; *et* Int. J. Pharm. Bio Sci. 3(2): 510. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 120. 2013.

Coelogyne lactea Rchb. f., Gard. Chron. n.s. 23: 692. 1885.

C. huettneriana sensu Hook. f., Fl. Brit. India 5(2): 830. 1890.

C. esquirolei Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 4: 60. 1919.

Plant epiphytic, rhizomatous herb, 18-34 cm tall. Pseudobulbs 4-11 × 1.6-3.8 cm, ovate-cylindric, grooved, clustered, sheathed. Leaves 2, 11-22 × 2-4.7 cm, oblong-elliptic, acuminate, petiolate. Inflorescence heteranthous, 13-28 cm long, 5 to 10-flowered; peduncle terete; rachis slightly zig-zag; pedicellate-ovary 2-2.5 cm long. Flowers 3.5-5 cm across, white; floral bracts caducous. Sepals and petals white. Sepals similar, 1.8-2.7 × 0.3-0.5 cm, lanceolate, acute. Petals 1.7-2.3 × 0.3-0.4 cm, linear, acute, reflexed. Lip 1.5-2.3 × 0.7-0.9 cm, 3-lobed, white with yellow on disc, keels white; side lobes nerves reddish-brown oblong, rounded; apical lobe spotted red at base, ovate-lanceolate, reflexed; disc with 3-lamellae. Column winged. Anther ovate; pollinia 2.

Flowering : March – May; Fruiting: April – July.

Specimen Cited : Neol forest 750 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0253**, dt. 20. 03. 2008.

Status : Common.

Local distribution : Relli, Mungpoo, Pedung, Birik, Neol forest, Seokbir khani, Panbu forest, Mungpoo, Birik, Pedung, Toonang forest, 300 – 1900 m.

General distribution : India (North East India, Sikkim, West Bengal); Nepal, Bhutan, China, Laos, Vietnam, Thailand and Myanmar.

Coelogyne fuscescens Lindl., Gen. Sp. Orchid. Pl.: 41. 1830; Hook. f., Fl. Brit. India 5: 833. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 132, t. 181. 1898; Bruhl, Guide Orch. Sikkim. 94. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 268. 1979; Banerji, Orch. Nepal. 53. 1982; Hedge, Orch. Arun. Pradh. 48. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 223. 1998; Bose *et al.* Orch. India. 160. 1999; Clayton, Genus *Coelogyne*. 182-183. 2002; Pearce & Cribb, Fl. Bhutan, 3(3): 328-329. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 106-107. 2005; Lucksom, Orch. Sikkim N.E. Himal. 473-474. t. 487, pl. 19. 2007; Misra, Orch. India. 288. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1539. 2012; *et Int. J. Pharm. Bio Sci.* 3(2): 510-511. 2012.

Plant epiphytic, rhizomatous herb, 19-35 cm tall. Pseudobulbs 5-13 × 1.4-2.8 cm, cylindric-fusiform, erect, deeply grooved. Leaves 2, 13-23 × 6-9.5 cm, oblong-elliptic, acute, petiolate. Inflorescence proteranthous, 4 to 9-flowered; peduncle 6-9 cm long; rachis 9-15 cm long, zigzag; pedicellate-ovary slender. Flowers 5.5-6 cm across, pale yellowish-green; floral bracts longer than the ovary. Dorsal sepals 3.5-3.9 × 1.7-1.9 cm, oblong-lanceolate, acute; lateral pair 3.4-3.8 × 1-1.3 cm, oblong-lanceolate, acute. Petals 3-3.5 × 0.3-0.4 cm, linear, acute. Lip 3.2-3.8 × 1.4-1.9 cm, 3-lobed, whitish with a pale yellow-green central stripe and marked with brown, elliptic-oblong, acute; side lobes short, rounded, reflexed; apical lobe ovate-elliptic, margins entire, undulate; disc 3-lamellae. Column 2-2.5 cm long, arcuate, winged. Anther 2-chambered; pollinia 4.

Flowering	: October – December; Fruiting: November – January.
Specimen cited	: Sangsay Bhalukhop Busty 950 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0186 , dt. 31. 10. 2007.
Status	: Common.
Local distribution	: Samalbung, Sinjee, Kurseong, Nimbong, Damsang Gari, Todey forest, Nimbong, East Main Road, 700 – 2000 m.
General distribution	: India (North East India, West Bengal, Sikkim); Bhutan, Myanmar, Nepal, China, Thailand.

Coelogyne nitida (Wall. *ex* D. Don) Lindl., Gen. Sp. Orchid. Pl.: 40. 1830; Pradhan, Indian Orch. Guide Identif. Cult. 2: 272. 1979; Hedge, Orch. Arun. Pradh. 48. 1984; Deva & Naithani, Orch. N.W. Himal. 231. t. 233. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 230. 1998; Bose *et al.* Orch. India. 162. 1999; Clayton, Genus *Coelogyne*. 189-190. 2002; Pearce & Cribb, Fl. Bhutan, 3(3): 330-331. 2002; Lucksom, Orch. Sikkim N.E. Himal. 476-477. t. 491, pl. 19. 2007; Misra, Orch. India. 289. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1539. 2012; *et Int. J. Pharm. Bio Sci.* 3(2): 511. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 122. 2013.

Cymbidium nitidum Wall. ex D. Don, Prodr. Fl. Nepal.: 35. 1825.

Coelogyne conferta Hort, Gard. Chron. N.s. 3: 314. 1875.

Coelogyne ochracea Lindl., Bot. Reg. 32: t.69. 1846; Hook. f., Fl. Brit. India 5: 831. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 132, t. 182. 1898; Bruhl, Guide Orch. Sikkim. 94. 1926; Tuyama in Hara, Fl. E. Himal. 1: 429. 1966; Tuyama in Hara, Fl. E. Himal. 2: 183. 1971; Pradhan & Pradhan, 100 Beaut. Orch. 53. 1997.

Plant epiphytic, rhizomatous herb, 14-33 cm tall. Pseudobulbs 4.3-8 × 1.4-2.5 cm, erect, ovoid-oblong to cylindrical, furrowed. Leaves 2, 13-26 × 2.5-4 cm, narrowly oblong, acute, petiolate. Inflorescence 12-20 cm long, proteranthous, 4 to 8-flowered, slightly zigzag; pedicellate-ovary 2-3.3 cm long; floral bracts caduceous. Flowers 4-5 cm across, white. Sepals and petals white. Sepals similar, 2.5-3.5 × 0.8-1.4 cm, narrowly oblong, subacute to obtuse. Petals 2.5-3 × 0.5-0.7 cm, narrowly oblong-lanceolate, subacute. Lip 2.3-2.9 × 1.2-1.6 cm, 3-lobed, ovate, white, disc yellow bordered with red on apical lobe; side lobes oblong, 4 yellow eye marks; apical lobe round; disc with 3-lamellae. Column slender, slightly arcuate, winged. Anther ovate; pollinia 4.

Flowering : February – June; Fruiting: March – July.

Specimen cited : Nockdara Busty 1700 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0195**, dt. 27. 02. 2008.

Status : Frequent.

Local distribution : Todey-Tangta, Lopchu forest, Samanden, Senchale, Lungshel, Samanden, 1450 – 2900 m.

General distribution : India (North Himalaya, Sikkim, West Bengal); Nepal, Bhutan, China, Laos, Myanmar, Bangladesh, Thailand.

Coelogyne occultata Hook. f., Fl. Brit. India 5(2): 832. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 135, t. 186. 1898; Bruhl, Guide Orch. Sikkim. 93. 1926; Tuyama in Hara, Fl. E. Himal. 2: 182. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 273. 1979; Hedge, Orch. Arun. Pradh. 48. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 230-234. 1998; Bose *et al.* Orch. India. 162. 1999; Clayton, Genus *Coelogyne*. 190. 2002; Pearce & Cribb, Fl. Bhutan, 3(3): 331. 2002; M. Pradhan, 100 N.E. Indian Orch. 88-89. 2006; Lucksom, Orch. Sikkim N.E. Himal. 477-478. t. 492, pl. 19. 2007; Misra, Orch. India. 289. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012; *et* Int. J. Pharm. Bio Sci. 3(2): 511. 2012. [Fig. 4.15]

Plant epiphytic, rhizomatous herb, 10-19 cm tall. Pseudobulbs 2.8-4 × 1.1-1.5 cm, obovoid or ellipsoid, apex turbinate, acute, ridged. Leaves 2, 6.5-11 × 2.2-2.8 cm, narrowly elliptic to elliptic-acute, petiolate. Inflorescence hysteroanthous, erect, 3 to 5-flowered; peduncle 4-7 cm long; rachis 3-6 cm long; pedicellate-ovary 0.8-1 × 0.2 cm. Flowers 4-5.5 cm across, white. Sepals and petals white. Sepals similar,

spreading, oblanceolate, acute; dorsal sepal 2.5-3.5 × 1-1.2 cm; lateral pair 2.5-3.5 × 0.8-1 cm. Petals 3-3.5 × 0.7-0.8 cm, narrow, linear-oblong, acute. Lip 2.7-3 cm long, 3-lobed, white; side lobes streaked with dull red-brown, erect, rounded, margins crenulate; apical lobe with yellow eyes, ovate, obtuse, margins crenulate; disc with 3-lamellae. Column 1.2-1.4 × 0.5-0.6 cm, winged. Anther dome shaped; pollinia 4.

Flowering : March – June; Fruiting: May – July.
Specimen cited : Baggonra forest 1900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1201**, dt. 30. 05. 2010.
Status : Rare.
Local distribution : Rachela, Jalapahar, Samanden, Senchale, 1800 – 2900 m.
General distribution : India (North East India, West Bengal, Sikkim); Bhutan.

Coelogyne ovalis Lindl., Bot. Reg. 24: misc.91, no.171.1838; Hook. f., Fl. Brit. India 5: 836. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 135, t. 187. 1898; Das & Jain, Fasc. Fl. India 5: 23. 1980; Bruhl, Guide Orch. Sikkim. 90. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 266. 1979; Banerji, Orch. Nepal. 53. 1982; Deva & Naithani, Orch. N.W. Himal. 235. t. 234. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 234. 1998; Bose *et al.* Orch. India. 164. 1999; Clayton, Genus *Coelogyne*. 53-54. 2002; Pearce & Cribb, Fl. Bhutan, 3(3): 327-328. 2002; M. Pradhan, 100 N.E. Indian Orch. 90-91. 2006; Lucksom, Orch. Sikkim N.E. Himal. 472. t. 485, pl. 18. 2007; Misra, Orch. India. 289. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1539. 2012; *et Int. J. Pharm. Bio Sci.* 3(2): 511. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 124. 2013.

Coelogyne fimbriata sensu Lindl., Gen. Sp. Orchid. Pl: 41. 1830, *non* Lindl. 1825.

Broughtonia linearis Wall. *ex* Lindl., *op. cit.* 42. 1830.

Coelogyne pilosissima Planchon, Hort. Donat.: 144. 1854.

C. decora Wall. *ex* Voigt, Hort. Suburb. Calcutt.: 621. 1845.

C. xerophyta Handel-Mazzetti, Symb. Sin. 7: 1346. 1936.

Plants epiphytic, rhizomatous herb, 14-24 cm tall. Pseudobulbs 4.8-8.5 × 1.3-1.9 cm, ovoid-fusiform to fusiform, smooth, base sheathed. Leaves 2, 9-15 × 2.8-3.6 cm, narrowly elliptic-oblong, acuminate, petiolate. Inflorescence, hysternanthus, racemes, 2-5-flowered; peduncle slender; pedicellate-ovary slender. Flowers 4-5.5 cm across, pale yellowish-green; floral bracts caduceus. Dorsal sepal 2.9-3.5 × 1.2-1.5 cm, ovate-lanceolate, acute; lateral pair 3-3.6 × 0.9-1.2 cm, lanceolate, acuminate, reflexed. Petals 2.7-3.4 × 0.1-0.3 cm, linear, acute, reflexed. Lip 2.9-3.1 × 1.9-2.5 cm, 3-lobed, saccate at base, marked brown; side lobes oblong, erect, lower part of margins ciliate; apical lobe ovate, apex rounded, mucronate, margins ciliate; disc with 3-lamellae. Column winged. Anther dome shaped; pollinia 4.

Flowering : October – November; Fruiting: November – January.
 Specimen cited : Suruk Busty 600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0145**, dt. 24. 10. 2007.
 Status : Sparse.
 Local distribution : Samalbong Busty, Lopchu, Nimbong, Solok-Kalimpong, Chisang-Godok, 800 – 1900 m.
 General distribution : India (North East India, West Bengal); Nepal, Bhutan, China, Thailand, Java, Myanmar, Sumatra.

Coelogyne pantlingii Lucksom, Orchid Review, vol. 113 no 1262. 108-109. 2005; Lucksom, Orch. Sikkim N.E. Himal. 478. t. 493, pl. 19. 2007; Mishra, Orch. India. 289. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012; *et* Int. J. Pharm. Bio Sci. 3(2): 511. 2012.

Plant epiphyte herb. Stem 10-18 cm long. Pseudobulb 2.7-3.5 × 0.8-1.2 cm, narrowly elliptic-oblong, laterally compressed. Leaves 2, 6-8.5 × 2-3 cm, terminal, elliptic-oblong, acute. Inflorescence 4-8 cm long, with 2 to 3-flowered; pedicellate-ovary ribbed. Flowers 3.6-5 cm across, white, pale green and yellow eyes on the lip; floral bracts elliptic-oblong. Sepals spreading, white, pale green; dorsal sepal 2.8-3.1 × 0.8-1.1 cm, elliptic, arched over column, apex acute; lateral pair 2.8-3.1 × 0.8-1 cm, lanceolate, concave, acute. Petals 2.7-3 × 0.5-0.7 cm, narrowly elliptic-lanceolate, acute. Lip 2-2.7 × 0.7-1.8 cm, ovate oblong, 3-lobed; side lobes oblong, round, erect, white with branched orange-brown nerves starting from base to apex; apical lobe oblong-ovate, sub-acute, with two heart shaped yellow eyes; disc with 3-wavy, crenulate lamellae. Column 1.5-1.6 × 0.5-0.5 cm, slightly arcuate, winged. Anther ovate; pollinia 4.

Flowering : June – July; Fruiting: July – September.
 Specimen cited : Sukiapokhari 2200 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0892**, dt. 11. 06. 2009.
 Status : Rare.
 Local distribution : Ramam, Senchale, Samanden, Serikhola, 2000–2600 m.
 General distribution : India (Darjeling hills and Sikkim).

Coelogyne pempahisheyana H.J. Chowdhery, Ind. J. of Forestry, vol. 27(1): 121-124, 2004; Mishra, Orch. India. 289. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012; *et* Int. J. Pharm. Bio Sci. 3(2): 511. 2012. [Fig. 4.16]

Plant epiphytic herb, 26-33 cm tall. Pseudobulbs 7.0-9.0 × 2.5-3.4 cm, conical to ovoid-oblong, shallow ridges, base sheathed. Leaves 2, 11.5-20 × 1.2-4.8 cm, from the apex of the pseudobulbs, oblong-elliptic, acute, petiolate. Inflorescence 17-20 cm

long, pendent, 5 to 9-flowered; pedicellate-ovary 1.4-1.5 cm long. Flowers 4.0-5.8 cm across, white, fragrant; floral bracts caduceous. Sepals white, unequal, lanceolate, acute; dorsal sepal 2.4-2.6 × 0.9-1.0 cm, wider than the laterals; lateral pair 2.5-2.7 × 0.8 cm. Petals 2.0-2.5 × 0.3-0.4 cm, white, linear, acute. Lip 1.7-2.3 × 0.7-0.9 cm, 3-lobed, white, without any colour blotch on disc; side lobes with faint yellow, dichotomously branched nerves, apex rounded; apical lobe oblong-ovate, reflexed, sub-acute; disc with 3 undulate keels. Column 1.4-1.6 cm, arcuate.

Flowering : March – April; Fruiting: April – June.
Specimen cited : Todey-Tangta forest 1600 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1146**, dt. 26. 04. 2010.
Status : Rare.
Local distribution : Nurserymen's Heaven, Holumba Floral Nursery - Kalimpong, 900 – 950 m.
General distribution : Darjeeling Hills (Endemic).

Coelogyne prolifera Lindl., Gen. Sp. Orchid. Pl.: 40. 1830; Bruhl, Guide Orch. Sikkim. 91. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 277. 1979; Bose *et al.* Orch. India. 164. 1999; Clayton, Genus *Coelogyne*. 44-45. 2002; Pearce & Cribb, Fl. Bhutan, 3(3): 335-336. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 108-109. 2005; Lucksom, Orch. Sikkim N.E. Himal. 484. t. 502, pl. 20. 2007; Misra, Orch. India. 289. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012; *et* Int. J. Pharm. Bio Sci. 3(2): 511. 2012.
Coelogyne flavida Wall. *ex* Lindl., Fol. Orchid. Coelogyne 5: 10, no.24. 1854; Hook. f., Fl. Brit. India 5: 839. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 138, t. 191. 1898; Tuyama in Hara, Fl. E. Himal. 1: 429. 1966; Tuyama in Hara, Fl. E. Himal. 2: 181-182. 1971; Chowdhery, Orch. Fl. Arun. Pradh. 219. 1998; Pradhan & Pradhan, 100 Beaut. Orch. 52. 1997.

Plant epiphytic herb, 14-38 cm tall. Pseudobulbs 3-7.5 × 1.7-2.5 cm, ovoid-cylindric, compressed, sheathed. Leaves 2, 15-23 × 2-3.2 cm, narrowly elliptic-oblong, acuminate, petiolate. Inflorescence 12-26 cm long, hysteroanthous, erect, 5 to 8-flowered; peduncle 5-20 cm long, slender; rachis 3.5-6 cm long, zigzag, with distichous glumes; pedicellate-ovary 0.9-1.2 cm long. Flowers 1.3-1.5 cm across, yellowish-green; floral bracts longer than the ovary. Sepals and petals yellowish-green. Sepals subsimilar, 8-9 × 4-5 mm, triangular to oblong, obtuse. Petals 7-9 × 1-2 mm long, linear, acute, reflexed. Lip 8-9 × 6-7 mm long, 3-lobed; side lobes enclosing the column; apical lobe yellow, rounded-retuse apex, margins undulate-dentate; disc with 2-lamellae. Column 5-6 mm long, straight, winged, apex 2-lobed.

Flowering : March – June; Fruiting: June – August.
Specimen cited : Nokdara Busty 1800 m, **Rajendra Yonzon, D. Lama and R.B. Bhujel 0269**, dt. 28. 03. 2008.

Status	: Common.
Local distribution	: Todey, Kumsi forest, Solok-Kalimpong, Kalimpong town (near forest museum; 600 – 1900 m.
General distribution	: India (North East India, Sikkim and West Bengal); Bhutan, Nepal China, Laos and Myanmar.

Coelogyne punctulata Lindl., Coll. Bot.: sub t.33. 1821; Pradhan, Indian Orch. Guide Identif. Cult. 2: 272. 1979; Hedge, Orch. Arun. Pradh. 49. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 234. 1998; Bose *et al.* Orch. India. 164. 1999; Clayton, Genus *Coelogyne*. 191-192. 2002; Pearce & Cribb, Fl. Bhutan, 3(3): 332. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 110-111. 2005; Lucksom, Orch. Sikkim N.E. Himal. 480. t. 496, pl. 20. 2007; Misra, Orch. India. 289. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1539. 2012; *et Int. J. Pharm. Bio Sci.* 3(2): 511. 2012.

Cymbidium nitidum sensu Roxb., Hort. Bengal: 63. 1814; Fl. Ind. ed. 1832(3): 459. 1832, *non* Wall. *ex* D. Don

Coelogyne ocellata Lindl., Gen. Sp. Orchid. Pl.: 40. 1830.

C. brevifolia Lindl., Fol. Orch.-Coelog. 7. 1854.

C. goweri Rchb. f., Gard. Chron. 1869: 443. 1869.

C. ocellata var. *maxima* Rchb. f., *op. cit.* n.s.11: 524. 1879.

C. ocellata var. *bodclaertiana* Rchb. f., *op. cit.* n.s. 18: 776. 1882.

C. nitida sensu (Roxb.) Hook. f., Fl. Brit. India 5(2): 837. 1890, *non* (Wall. *ex* D. Don) Lindl.

Pleione goweri (Rchb. f.) Kuntze, Revis. Gen. Pl. 2: 680. 1891.

P. nitida (Roxb.) Kuntze. *loc. cit.* 1891.

Coelogyne punctulata var. *hysterantha* Tang & Wang, Acta Phytotax. Sin. 1(1): 78. 1951.

Plant epiphytic herb, 11-33 cm tall. Pseudobulbs 3-6.4 cm long, subpyriform, angular, sheathed. Leaves 2, 13-18 × 2.5-3.4 cm, narrowly lanceolate, acute, petiolate. Inflorescence hysteroanthous, 4 to 5-flowered; peduncle 6.3-8.7 cm long; rachis 4.5-6 cm long, slightly zigzag; pedicellate-ovary 2.6-3.5 × 0.3-0.4 cm long. Flowers 4-5 cm across, white; floral bracts longer than the ovary. Sepals, petals and lip white. Sepals similar, 3.2-3.6 × 1.1-1.2 cm, oblong-lanceolate, acute. Petals 2.9-3.3 × 0.6-0.7 cm, linear-lanceolate, obtuse. Lip 2.6-2.9 × 1.3-2.4 cm, 3-lobed; side lobes oblong-ovate, entire, 2 yellow spots on each side; apical lobe ovate; disc 3-lamellae, dentate, 2 divergent lateral keels on apical lobe. Column 1.7-2.2 cm long, clavate, winged.

Flowering	: October – December; Fruiting: November – January.
Specimen cited	: Damsang Gari 1800 m, Rajendra Yonzon, D. Lama and R. B. Bhujel 1496 , dt. 15. 10. 2010.
Status	: Rare.
Local distribution	: Rimbick, Rambi forest, Nockdara, Lava;

1300–2200 m.

General distribution : India (North East India, Sikkim); China, Myanmar and Thailand.

Coelogyne raizadae S.K. Jain & S. Das, Proc. Indian Acad. Sci., B. 87(5): 119. 1978; Chowdhery, Orch. Fl. Arun. Pradh. 237. 1998; Clayton, Genus *Coelogyne*. 45-46. 2002; Pearce & Cribb, Fl. Bhutan, 3(3): 336. 2002; Lucksom, Orch. Sikkim N.E. Himal. 482-483. t. 499. 2007; Misra, Orch. India. 289. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012; *et* Int. J. Pharm. Bio Sci. 3(2): 511. 2012.

Coelogyne longipes sensu Hook. f., Fl. Brit. India 5(2): 839. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 136, t. 189. 1898.

Plant epiphytic, rhizomatous herb, 18-33 cm tall. Pseudobulbs 7-10 × 1-1.3 cm, cylindric or narrowly oblong, sheathed. Leaves 2, 7-11 × 1.7-2.6 cm, elliptic-oblong, acute, entire. Inflorescence hysteranthous, 4 to 7-flowered; peduncle 8-17 cm long, sheaths; rachis 4.5-8 cm long, slightly zigzag; pedicellate-ovary 0.5-0.7 cm long. Flowers 1.2-1.6 × 0.5-0.6 cm across, whitish-pale; floral bracts caduceus. Sepals subsimilar, 1.2-1.5 × 0.4-0.5 cm, oblong-lanceolate, acute. Petals 0.9-1.3 × 0.1 cm, filiform, reflexed, acute, entire. Lip 1.2-1.4 × 0.6-0.8 cm, 3-lobed; side lobes narrowly oblong, obtuse, clasping the column; apical lobe oblong-obcordate, margins undulate-crenulate; disc 3-lamellae. Column 1-1.3 cm long, winged. Anther ovate; pollinia 4.

Flowering : April – June; Fruiting: May – August.

Specimen cited : Rimbick 2100 m, **Rajendra Yonzone, D. Lama and R.B. Bhujel 0821**, dt. 20. 04. 2009.

Status : Sparse.

Local distribution : Baggonra, Toroyok, Rambi forest, Nockdara, Lava, Damsang gari, 1800 – 2400 m.

General distribution : India (North East India, Sikkim); Bhutan, Laos, Nepal, South West China.

Coelogyne stricta (D. Don) Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 4: 184. 1919; Pradhan, Indian Orch. Guide Identif. Cult. 2: 276. 1979; Deva & Naithani, Orch. N.W. Himal. 235-237. t. 236. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 241. 1998; Bose *et al.* Orch. India. 164. 1999; Clayton, Genus *Coelogyne*. 40. 2002; Pearce & Cribb, Fl. Bhutan, 3(3): 333 & 335. 2002; Lucksom, Orch. Sikkim N.E. Himal. 481-482. t. 498, pl. 20. 2007; Misra, Orch. India. 289. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012; *et* Int. J. Pharm. Bio Sci. 3(2): 511. 2012.

Cymbidium strictum D. Don, Prodr. Fl. Nepal.: 35. 1825.

Coelogyne elata Lindl., Gen. Sp. Orchid. Pl.: 40. 1830; Hook. f., Fl. Brit. India 5: 838. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 136, t. 188. 1898;

Bruhl, Guide Orch. Sikkim. 90. 1926; Tuyama in Hara, Fl. E. Himal. 1: 429. 1966; Tuyama in Hara, Fl. E. Himal. 2: 181. 1971; Banerji, Orch. Nepal. 50. 1982; Hedge, Orch. Arun. Pradh. 47-48. 1984. [Plate 4.9]

Plant epiphytic, rhizomatous herb, 28-54 cm tall. Pseudobulbs 6-10 × 3.4-4.8 cm, oblong-cylindric, glossy green. Leaves 2, 21-47 × 4-7.5 cm, elliptic oblong, acute, petiolate. Inflorescence 17-38 cm long, hysteroanthous, 7 to 12-flowered; peduncle 9-27 cm long, erect; rachis 7-12 cm long; pedicellate-ovary 2-2.6 cm long. Flowers 3.6-4 cm across, whitish-yellow; floral bracts caduceus. Sepals similar, 2.1-2.5 × 0.8-1 cm, oblong, subacute, spreading. Petals 2-2.4 × 0.4-0.6 cm, narrowly oblong, acute. Lip 1.9-2.2 × 1.4-1.7 cm, 3-lobed, whitish-yellow with yellow-orange patch near base of apical lobe; side lobes erect, narrow, entire; apical lobe suborbicular, margins erose; disc with 2-lamellae. Column 1-1.4 cm long, winged. Anther dome shaped; pollinia 4.

Flowering : February – April; Fruiting: March – May.
Specimen cited : Nimbong forest 800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1059**, dt. 05. 03. 2010
Status : Rare.
Local distribution : Sittong, Mungpoo, Seokbir khani, Samthar, 600 – 1300 m.
General distribution : India (North East India, Sikkim, West Bengal); Nepal, Bhutan, China.

Coelogyne viscosa Reichb. f., Berg. Alig. Gartenz. 24: 218. 1856 *et* Gard. Chron. 1085. 1870; Hook. f., Fl. Brit. India 5: 832. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 268. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 245. 1998; Bose *et al.* Orch. India. 167. 1999; Clayton, Genus *Coelogyne*. 215-216. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 112-113. 2005; Lucksom, Orch. Sikkim N.E. Himal. 474. t. 488, pl. 19. 2007; Misra, Orch. India. 289. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012; *et* Int. J. Pharm. Bio Sci. 3(2): 511. 2012.

Coelogyne graminifolia Par. & Reichb. f., Trans. Linn. Soc. 30: 146. 1874; Hook. f. Fl. Brit. Ind. 5; 831. 1890; Seidenf., Dansk Bot. Ark. 29 (4); 37. 1975. [Fig. 4.17]

Plant epiphytic herb, 25-47 cm tall. Pseudobulb 3.8-7.5 × 2.3-4.2 cm, ovoid, ribbed, sheathed. Leaves 2, 23-42 × 1.3-1.8 cm, linear-lanceolate, acute, petiolate. Inflorescence 6-14 cm long, 2 to 6-flowered, erect, proteranthous; peduncle erect; rachis 1-4 cm long; pedicellate-ovary ribbed. Flower 3.4-5.5 cm across, white; floral bract caduceus. Sepals and petals white, spreading. Sepals similar, elliptic-lanceolate, acute, externally keeled; dorsal sepal 2.5-2.7 × 0.9-1.2 cm; lateral pair 2.8-3 × 0.9-1 cm. Petals 2.2-2.6 × 0.5-0.6 cm linear, acute. Lip 2.1-2.5 × 1.3-1.8 cm, 3-lobed, ovate; side lobes oblong, obtuse, blunt apical tip tinged with yellow; apical lobe elliptic-ovate, with apiculate tip, white tinged with yellow, decurved; disc with

3-lamellae. Column 1.5-1.9 × 0.5-0.6 cm, winged. Anther oblong-ovate; pollinia oblong.

- Flowering : February – April; Fruiting: April – June.
Specimen cited : Godok Busty 900 m, **Rajendra Yonzone, D. Lama and R.B. Bhujel 0767**, dt. 26. 02. 2009.
Status : Rare.
Local distribution : Today, Kumsi, Mirik, Latpanjar, Samsing, 500–1800 m.
General distribution : India (Arunachal Pradesh, Assam, Meghalaya, Mizoram and Sikkim); Myanmar, Thailand, China, Laos and Vietnam.

Otochilus Lindl.

Plants epiphytic herb. Pseudobulbs forming a chain, arising from apex of the previous pseudobulb, cylindrical, fleshy. Leaves 2 from pseudobulb apex, linear, elliptic or lanceolate, plicate, petiolate. Inflorescence proteranthous or synanthous, racemes, curved, arising from between leaves, laxly few to many flowered. Flowers medium in size. Sepals and petals subequal, free, spreading. Lip sessile at base of column, saccate at base, 3-lobed, callose; side lobes erect, auriculate; apical lobe oblong, elongate. Column elongate, erect, semi-terete, clavate. Anther subterminal, operculate; pollinia 4.

The genus *Otochilus* Lindl., comprises 5 species distributed in the Himalayas, China, Myanmar, Thailand and Vietnam.

Key to the species

1. Flowers more than 2 cm across..... *O. lancilabius*
- 1a. Flowers less than 1.7 cm across2
2. Leaves ovate-lanceolate; flowers
1.4-1.7 cm across; sepals and petals acute *O. albus*
- 2a. Leaves linear-lanceolate; flowers
1.1-1.5 cm across; sepals and petals obtuse..... *O. fuscus*

Otochilus albus Lindl., Gen. Sp. Orchid. Pl.: 35. 1830, *sphalm. alba*. Hook. f., Fl. Brit. India 5: 843. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 143, t. 200. 1898; Bruhl, Guide Orch. Sikkim. 96. 1926; Tuyama in Hara, Fl. E. Himal. 2:

192. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 163. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 288. 1979; Banerji, Orch. Nepal. 79. 1982; Hedge, Orch. Arun. Pradh. 49. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 98. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 557. 1998; Bose *et al.* Orch. India. 362. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 342. 2002; Lucksom, Orch. Sikkim N.E. Himal. 509. t. 523, pl. 21. 2007; Misra, Orch. India. 311. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1546. 2012.

Broughtonia pendula Wall. *ex* Lindl., Gen. Sp. Orchid. Pl.: 35. 1830. [Fig. 4.18]

Plant epiphytic herb. Pseudobulbs 5.2-7.6 cm long, subcylindric, grooved, sheathed. Leaves 2, 10-15 × 2.1-3.6 cm, ovate-lanceolate, acuminate, petiolate. Inflorescence 7-10 cm long, synanthous, laxly 9 to 16-flowered; peduncle 2-3.4 cm long; rachis 5-9 cm long, slightly zigzag; pedicellate-ovary 0.6-0.9 cm long. Flowers 1.4-1.7 cm across, white; floral bracts ovate-lanceolate. Sepals similar, 0.8-1 × 0.2-0.3 cm, oblong-lanceolate, acute; lateral pair 0.8-1.1 × 0.2-0.3 cm. Petals 0.7-1 × 0.1-0.2 cm, narrowly oblong-lanceolate, acute. Lip 0.5-0.6 × 0.2-2.3 cm, 3-lobed, white with yellowish brown band at the disc, base saccate; side lobes broad, acute; apical lobe oblong, apiculate-deflexed from base. Column 6.4-7.5 mm long, slender, winged. Pollinia 4.

Flowering	: March – July; Fruiting: May – August.
Specimen cited	: Pedung Busty 1000 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0261 , dt. 26. 03. 2008.
Status	: Frequent.
Local distribution	: Lava, Algarah, Durpin-Kalimpong, Tungsong, Dello, Chimney-Kurseong, 900 – 2100 m.
General distribution	: India (North East India, Sikkim, West Bengal); China, Myanmar, Nepal, Thailand, Vietnam.

Otochilus fuscus Lindl., Gen. Sp. Orchid. Pl.: 35. 1930, *sphalm. fusca*. Hook. f., Fl. Brit. India 5: 844. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 143, t. 199. 1898; Bruhl, Guide Orch. Sikkim. 96. 1926; Tuyama in Hara, Fl. E. Himal. 1: 447. 1966; Tuyama in Hara, Fl. E. Himal. 2: 192. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 163. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 287. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 99. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 557-559. 1998; Bose *et al.* Orch. India. 362. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 342-343. 2002; Lucksom, Orch. Sikkim N.E. Himal. 508-509. t. 522, pl. 21. 2007; Misra, Orch. India. 311. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1546. 2012.

Broughtonia ?amoena Wall. *ex* Lindl., Gen. Sp. Orchid. Pl.: 35. 1830.

Otochilus lancifolius Griff., Itin. Pl. Khasyah Mts.: 69, no.1074. 1848; Not. Pl. Asiat. 3: 278. 1851; Icon. Pl. Asiat. 3: t.289. 1851.

Coelogyne fusca (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 236. 1861; Banerji, Orch. Nepal. 79-80. 1982; Hedge, Orch. Arun. Pradh. 50. 1984.

Plant epiphytic herb. Pseudobulbs 3.5-7.5 cm long, cylindric-fusiform, rugose, pendent, sheathed. Leaves 2, 10-21 × 1.4-1.8 cm, linear-lanceolate, acuminate, petiolate. Inflorescence 10-18 cm long, proteranthous, semi-erect, laxly, 15 to 26-flowered; peduncle 2-4 cm long; rachis 6-14.5 cm long, glabrous; pedicellate-ovary 0.4-0.6 cm long. Flowers 1.1-1.5 cm across, white; floral bracts scarious. Sepals 7-8 × 1.4-2 mm, subequal, linear-oblong, obtuse, spreading. Petals 6-8 × 0.6-1.1 mm, linear-oblong, obtuse. Lip 6-7 mm long, base shortly saccate, tinged pink; side lobes short, erect, rounded, acute; apical lobe oblong, acute, deflexed. Column 5-6 mm, short, curved, slightly winged and dilated at apex.

Flowering : November – April; Fruiting: December – May.
 Specimen cited : Samthar Busty 1300 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0692**, dt. 12. 01. 2008.
 Status : Frequent.
 Local distribution : Suruk, Dello Hill, Seokbir Khani, Nimbong, Samalbong, East Man Road-Kalimpong, 700–2200 m.
 General distribution : India (North East India, Sikkim, West Bengal); Bhutan, Cambodia, Myanmar, Nepal, Thailand, Vietnam.

Otochilus lancilabius Seidenf., Bot. Tidsskr. 71: 13, t.11. 1976; Opera Bot. 89: 94. 1986; Pradhan, Indian Orch. Guide Identif. Cult. 2: 287. 1979; Deva & Naithani, Orch. N.W. Himal. 323 – 325. t. 326. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 559. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 343 & 345, t. 344. 2002; Lucksom, Orch. Sikkim N.E. Himal. 508. t. 521, pl. 21. 2007; Misra, Orch. India. 311. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1546. 2012.

Otochilus porrectus sensu Hook. f., Fl. Brit. India. 5(2): 844. 1890, *non* Lindl.; Bruhl, Guide Orch. Sikkim. 96. 1926; Tuyama in Hara, Fl. E. Himal. 1: 447. 1966; Tuyama in Hara, Fl. E. Himal. 2: 192. 1971; Bose *et al.* Orch. India. 362. 1999.

O. alba var. *lancilabius* (Seidenf.) Pradhan, Indian Orch.: Guide Identify. Cult. 2: 706. 1979.

Plant epiphytic herb. Pseudobulbs 3-11 cm long, subcylindric, elongate-fusiform to clavate, sheathed. Leaves 2, 13-22 × 4-5.6 cm, elliptic-lanceolate, acuminate, petiolate. Inflorescence 10-17 cm long, proteranthous, laxly 8 to 13-flowered, peduncle 3-5 cm long; rachis 7-12 cm long; pedicellate-ovary 1.3-1.6 cm long. Flowers 1.8-2.4 cm long, white; floral bracts linear. Sepals subsimilar, linear-oblong, acute; dorsal sepal 1.2-1.6 × 0.2-0.3 cm, concave; lateral pair 1.1-1.4 × 0.2-0.3 cm, slightly falcate. Petals 1.2-1.6 × 0.1-0.2 cm, linear, acute. Lip 1-1.4 × 0.2-0.3 cm, 3-lobed, linear-lanceolate, acute; side lobes obtuse; apical lobe slender lanceolate, subacute; disc 3-keeled. Column 1-1.3 cm long, slender, curved, winged. Anther cap broadly triangular, obtuse; pollinia 4.

Flowering	: October – January; Fruiting: November – February.
Specimen cited	: Damsang Gari, 1800 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0748 , dt. 14. 12. 2008.
Status	: Frequent.
Local distribution	: Tangta, Algarah, Baggonra, Nockdara, Toroyok, Jalapahar, Baggonra, 800 – 3000 m.
General distribution	: India (Sikkim, West Bengal); Bhutan, Nepal.

Panisea (Lindl.) Steud.

Plant epiphytic or lithophytic herb; rhizome branched. Pseudobulbs 1-noded, ovoid to obliquely ovoid to obliquely ovoid. Leaves 2, arising from pseudobulb apex, narrowly elliptic to linear, petiole or sessile. Inflorescence proterantous, hysteranthous or heteranthous, racemes, 1 to several-flowered. Flowers small to medium in size. Sepals and petals subsimilar, free. Lip entire or 3-lobed, sigmoidally curved at base; callose or ecallose. Column slender, incurved, hooded at apex; foot short; pollinia 4.

The genus *Panisea* (Lindl.) Steud., comprises 7 species distributed in North India, Nepal, Bhutan and South East Asia.

Key to the species

1. Inflorescence solitary flower; flower 2.5-3.4 cm across..... ***P. uniflora***
- 1a. Inflorescence 4-8 flowered; flower 1.2-1.5 cm across..... ***P. demissa***

Panisea demissa (D. Don) Pfitz., Engler, Pflanzenr. (IV.50) Coelog.: 141, t.49. 1907; Hedge & A.N. Rao, Indian J. Forestry 7(1): 78. 1984; Pradhan, Indian Orch. Guide Identif. Cult. 2: 286. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 565. 1998; Bose *et al.* Orch. India. 364. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 345 & 347, t. 346. 2002; Lucksom, Orch. Sikkim N.E. Himal. 439. t. 470, pl. 18. 2007; Misra, Orch. India. 311. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1546. 2012.

Dendrobium demissum D. Don, Prodr. Fl. Nepal.: 34. 1825.

Coelogyne parviflora Lindl., Gen. Sp. Orchid. Pl.: 44. 1830.

Panisea parviflora (Lindl.) Lindl., Fol. Orchid. Panisea 5: 1, no.1. 1854; Hook. f., Fl. Brit. India 5: 783. 1890; Bruhl, Guide Orch. Sikkim. 95. 1926; Banerji, Orch. Nepal. 80 & 83. 1982.

P. reflexa Lindl., *op. cit.* no.2. 1854.

P. demissa var. *reflexa* (Lindl.) Pfitz., Engler, Pflanzenr. (IV.50) Coelog.: 141. 1907.

Plant epiphytic herb, 6-13 cm tall. Pseudobulbs 1.6-5 × 0.7-1.1 cm, clustered, narrowly ovoid to ovoid. Leaves 2, 3-8.4 × 0.9-1.9 cm, elliptic-lanceolate, acute, petiolate. Inflorescence proteranthous, decurved, laxly 4 to 8-flowered; peduncle 1.5-2 cm long; rachis 2.5-3 cm long; pedicellate-ovary slender. Flowers 1.2-1.5 cm across, white; floral bracts membranous. Sepals similar, oblong-lanceolate, slightly saccate at base, dorsally keeled; dorsal sepal 0.9-1.2 × 0.3-0.4 cm; lateral pair 0.9-1.1 × 0.2-0.3 cm. Petals 0.8-1.2 × 0.2-0.3 cm, oblong, obtuse. Lip 0.9-1.2 × 0.2 cm, white with yellow median strip, oblong, subacute, sigmoidally bent, narrow at base, nerved, ecallose. Column 0.9-1 cm long, winged. Anther dome shaped; pollinia 4.

Flowering : October – December; Fruiting: November – January.

Specimen cited : Chimney forest-Kurseong 2000 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0730**, dt. 05. 11. 2008.

Status : Sparse.

Local distribution : Lopchu, Lava, Rachel, Chitrey, Gorkhey, 1900 – 3200 m.

General distribution : India (North East India, Sikkim, West Bengal); Bhutan, China, Laos, Myanmar, Nepal, Thailand and Vietnam.

Panisea uniflora (Lindl.) Lindl., Fol. Orchid. Panisea 5: 2, no.4. 1854; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 285. 1979; Pearce & Cribb, Fl. Bhutan, 3(3): 347-348. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 114-115. 2005; Lucksom, Orch. Sikkim N.E. Himal. 438-439. t. 469, pl. 18. 2007; Misra, Orch. India. 311. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1546. 2012.

Coelogyne uniflora Lindl., Gen. Sp. Orchid. Pl.: 42. 1830; Bruhl, Guide Orch. Sikkim. 91. 1926; Tuyama in Hara, Fl. E. Himal. 2: 183. 1971; Banerji, Orch. Nepal. 53. 1982; Bose *et al.* Orch. India. 167. 1999.

C. thuniana Rchb. f., Allg. Gartenzeitung 23: 145. 1855.

C. biflora Par. & Rchb. f., Gard. Chron. 1865: 1035. 1855.

C. falcata T. Anderson *ex* Hook. f., Ann. Roy. Bot. Gard. (Calcutta) 5: 29, t.43. 1895.

Chelonistele biflora (Par. & Rchb. f.) Pfitz., Engler, Pflanzenr. (IV.50) Coelog.: 139. 1907. [Plate 4.10]

Plant epiphytic herb, 10-19 cm tall. Pseudobulbs 1.9-3 × 0.8-1.6 cm, caespitose, ellipsoid to ovoid, smooth, sheathed at base. Leaves 2, 7-16 × 0.8-1.1 cm, linear-oblong, acute, coriaceous, petiolate. Inflorescence proteranthous or heteranthous, solitary flowered; peduncle 2.7-3.6 cm long; pedicellate-ovary 1.6-1.7 cm long. Flower 2.5-3.4 cm across, pale-green; floral bract ovate. Sepals subsimilar, oblong-

lanceolate, acuminate, spreading; dorsal sepal 1.6-1.9 × 0.5-0.6 cm; lateral pair 1.7-2 × 0.5-0.6 cm. Petals 1.4-1.8 × 0.4-0.5 cm, lanceolate-elliptic, acuminate. Lip 1.5-1.7 × 0.8-1 cm, 3-lobed; side lobes 4-7 yellow spots, falcate; apical lobe ovate; disc with obscure keels. Column 8-9 mm long, winged; foot short. Anther 2-chambered; pollinia 4.

- Flowering : April – June; Fruiting: May – July.
 Specimen cited : Kalijhora forest 350 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0718**, dt. 14. 04. 2008.
 Status : Rare.
 Local distribution : Pankhabari forest, Nimbong, Sittong, Guling forest, 300 – 1000 m.
 General distribution : India (North East India, Sikkim, West Bengal); Bhutan, Laos, Myanmar, Nepal, Thailand and Vietnam.

Pholidota Lindl. *ex* Hook.

Plants perennial epiphytic or lithophytic herbs. Pseudobulbs slender or swollen. Leaf solitary or 2, narrowly elliptic, ovate or oblong, petiolate, coriaceous or herbaceous. Inflorescence terminal from pseudobulb apex, slender, racemes, distichous, pendent, laxly to densely many-flowered; floral bracts, large, concave. Flowers small, fleshy, resupinate or non-resupinate. Dorsal sepal concave or convex, broadly ovate to elliptic; lateral pair concave or convex, ovate to ovate-oblong, often keeled. Petals ovate to linear. Lip sessile, base saccate; epichile subentire, or 4-lobed, deflexed. Column short, apex broadly hooded; pollinia 4.

The genus *Pholidota* Lindl. *ex* Hook., comprises 29 species distributed in Tropical South East Asia, the Malay Archipelago, Australia and the Pacific Islands.

Key to the species

1. Each new shoot developing from apex of previous pseudobulb2
 - 1a. Each new shoot developing from base of a pseudobulb4
2. Flowers resupinate; rachis zigzag.....3
 - 2a. Flowers secund; rachis not zigzag..... *P. recurva*
3. Flowers 0.8-1.2 cm across;
 - pedicellate-ovary 0.5-1.2 cm long;
 - floral bracts 0.9-1.4 cm long;

- sepals and petals 5-nerved.....*P. articulata*
- 3a. Flowers 0.8-0.85 cm across;
pedicellate-ovary 3.5-4 mm long;
floral bracts 0.5-0.9 cm long;
sepals and petals 3-nerved.....*P. articulata* var. *griffithii*
4. Pseudobulb with solitary leaf5
- 4a. Pseudobulb with 2 leaves *P. rubra*
5. Pseudobulbs ovoid-conical; rachis 10-30 cm long;
lateral pair free at base *P. imbricata*
- 5a. Pseudobulbs slender to swollen; rachis 5-13 cm long;
lateral pair connate at base *P. pallida*

Pholidota articulata Lindl., Gen. Sp. Orchid. Pl.: 38. 1830; Hook. f., Fl. Brit. India 5: 844. 1890; Bruhl, Guide Orch. Sikkim. 98. 1926; Tuyama in Ohashi, Fl. E. Himal. 3: 163. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 294. 1979; Banerji, Orch. Nepal. 83. 1982; Hedge, Orch. Arun. Pradh. 50. 1984; Deva & Naithani, Orch. N.W. Himal. 329 – 330 t. 331. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 589. 1998; Bose *et al.* Orch. India. 392. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 349, t. 350. 2002; M. Pradhan, 100 N.E. Indian Orch. 94-95. 2006; Lucksom, Orch. Sikkim N.E. Himal. 512-513. t. 527, pl. 21. 2007; Misra, Orch. India. 313. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1547. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 260. 2013.

Pholidota khasyana Rchb. f., Bonplandia 4: 329. 1856.

Coelogyne articulata (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 238. 1861.

Pholidota griffithii Hook. f., Fl. Brit. India 5(2): 845. 1890; Tuyama in Hara, Fl. E. Himal. 2: 193. 1971.

P. obovata Hook. f., loc. cit. 1890.

P. articulata var. *griffithii* (Hook. f.) King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 147, t.204. 1898.

P. articulata var. *obovata* (Hook. f.) Tang & Wang, Acta Phytotax. Sin. 1: 40, 79. 1951.

Plant epiphytic herb, 23-45 cm long. Pseudobulbs 3.8-9 cm long, slender to swollen. Leaves 2, 6.5-12 × 2-3.7 cm, ovate to linear-lanceolate, acuminate, petiolate. Inflorescence synanthous, 9 to 21-flowered; peduncle 3.2-4.5 cm long; rachis 3.7-6.4 cm long; pedicellate-ovary 0.5-1.2 cm long, terete, curved. Flowers 0.8-1.2 cm across, white suffused with brownish-pink; floral bracts ovate-oblong. Sepals and petals 5-nerved. Dorsal sepal 0.6-0.8 × 0.3-0.4 mm, ovate to ovate-oblong, obtuse; lateral pair 0.7-0.8 × 0.3-0.4 mm, ovate-lanceolate, acute. Petals 0.4-0.5 × 0.2-0.25 cm, ovate to ovate-lanceolate, obtuse to acuminate. Lip 5-8 mm long, constricted in middle; hypochile boat-shaped, inflated, tapering, 5-keeled; epichile recurved, 2-

lobed, lobules rounded. Column 1.5-2.5 mm long, shortly clavate, hooded. Anther cordate; pollinia 4.

Flowering : April – July; Fruiting: June – August.
Specimen cited : Samalbung Busty 1000 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0393**, dt. 20. 05. 2008.
Status : Frequent.
Local distribution : Kalijhora, Seokbir khani, Toonang forest, Nimbong, East Man Road, 300 – 1600 m.
General distribution : India (North East India, Sikkim, West Bengal); Bhutan, Borneo, Cambodia, Java, Myanmar, Nepal, Sumatra, Thailand, Vietnam.

Pholidota articulata Lindl. var. *griffithii* (Hook. f.) King & Pantl., Ann Bot. Gard. (Calcutta): 147, t.204. 1898; Hook. f., Fl. Brit. India 5: 857. 1890; Tuyama in Hara, Fl. E. Himal. 2: 193. 1971; Lucksom, Orch. Sikkim N.E. Himal. 513. t. 528, pl. 21. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1547. 2012.

Pholidota griffithii Hook. f., Fl. Brit. India 5(2): 845. 1890; Tuyama in Ohashi, Fl. E. Himal. 3: 163. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 294. 1979; Banerji, Orch. Nepal. 83-84. 1982.

Plant epiphytic herb, 20-42 cm tall. Pseudobulbs 4-12 × 0.4-0.5 cm, cylindrical, furrowed, smooth, yellowish-green. Leaves 2, 8.5-10 × 2-3.5 cm, narrowly elliptic, acuminate, petiolate. Inflorescence solitary, slender, pendulous, synanthous; peduncle 4-5 cm long, slightly compressed, smooth; rachis 5-6 cm long, smooth, with many shortly pedicellate flowers arranged in zigzag pattern; pedicellate-ovary 3.5-4 mm long. Flowers 8-8.5 mm across, yellowish-green, glabrous; floral bracts oblong-ovate. Sepals and petals 3-nerved. Sepals subequal, spreading; dorsal sepal 5.5-6 × 2.8-3 mm, narrowly elliptic-oblong, sub-acute; lateral pair 2.8-3 × 2.3-2.5 mm, externally keeled. Petals 4.5-4.8 × 1.8-2 mm, rhomboid lanceolate, sub-acute. Lip 4-5 mm long, obscurely 3-lobed, white suffused with pink; basal lobe cymbiform with 5 calli; apical lobe emarginated and folded at the base into a narrow mesochile, white suffused with yellow. Column c. 2.5 mm long, slightly winged. Anther winged; pollinia 4.

Flowering : April – August; Fruiting: June – September.
Specimen cited : Samalbung Busty 900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0887**, dt. 10. 06. 2009.
Status : Sparse.
Local distribution : Yangmakum, Pembling, Mangzing, Guling forest, Pembling, 400 – 1200 m.
General distribution : India (Sikkim, West Bengal).

Pholidota imbricata Hook. f., Exot. Fl. 2: t.138. 1825; Hook. f., Fl. Brit. India 5: 845. 1890; King & Pantl., Ann Bot. Gard. (Calcutta): 144, t.201. 1898; Bruhl, Guide Orch. Sikkim. 96. 1926; Tuyama in Hara, Fl. E. Himal. 1: 447. 1966; Tuyama in Hara, Fl. E. Himal. 2: 193. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 163-164. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 290. 1979; Banerji, Orch. Nepal. 84. 1982; Hedge, Orch. Arun. Pradh. 51. 1984; Deva & Naithani, Orch. N.W. Himal. 330 – 335. t. 110. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 110. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 589. 1998; Bose *et al.* Orch. India. 393. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 352-353. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 116-117. 2005; Lucksom, Orch. Sikkim N.E. Himal. 510-511. t. 525, pl. 21. 2007; Misra, Orch. India. 313. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1547. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 262. 2013; Misra, Orch. Odisha. 260-261. 2014.

Ptilocnema bracteatum D. Don, Prodr. Fl. Nepal.: 33. 1825.

Cymbidium imbricatum Roxb., Fl. Ind. ed.1832, 3: 460. 1832.

Coelogyne imbricata (Roxb.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 238. 1861.

Pholidota assamica Regel, Gartenflora 39: 607. 1890.

P. henryi Kranz., Vierteljahrsschr. Naturf. Ges. Zurich 60: 427. 1915.

P. imbricata var. *henryi* (Kranz.) Tang & Wang, Acta Phytotax. Sin. 1: 40, 79. 1951.

P. pallida sensu Holtt., Orchid Malaya ed.3: 237. 1964.

P. bracteata (D. Don) Seidenf., Opera Bot. 89: 100. 1986.

Plant epiphytic herb, 16-47 cm tall. Pseudobulbs 5-10 × 1.6-2 cm, ovoid-conical, sheathed. Leaf solitary, 19-40 × 4.7-8.6 cm, arises from pseudobulb tip, oblong, linear-lanceolate, acuminate, coriaceous, petiolate. Inflorescence synanthous, densely many-flowered; peduncle 11-15 cm long, terete, glabrous, sheathless; rachis 10-30 cm long; pedicellate-ovary 4-6.3 × 1.1-1.6 mm. Flowers 0.5-0.6 cm across, white tinged with yellowish-green, arranged in two rows; floral bracts ovate. Dorsal sepal 5-6 × 3-4 mm, ovate, obtuse to acute, forming a hood with the petals; lateral pair 5-7 × 2.6-3.4 mm, ovate-oblong, acute, free at base. Petals 4.5-5 × 1.4-2.1 mm, falcate, acute. Lip 0.6-0.9 × 0.5-0.8 cm, 3-lobed, 1 or 2 yellow spots on disc; side lobes erect, semi-orbicular; apical lobe deeply 2-lobed, retuse in front, lobes semi-orbicular; disc with 3 short, wing-like keels at base. Column 2.9-3.7 mm long. Anther brown; pollinia 4.

Flowering	: March – July; Fruiting: May – August.
Specimen cited	: Samalbong Busty 1000 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0487 , dt. 14. 06. 2008.
Status	: Frequent.
Local distribution	: Relli, Kalijhora, 27 th Mile N.H.P.C. Project sides, Lohapul, 300 – 1200 m.
General distribution	: India (North East India, Sikkim, West Bengal); Australia, Bangladesh, Bhutan, China, Indonesia,

Laos, Malaysia, Myanmar, Philippines, South
West Pacific Islands, Thailand, Vietnam.

Pholidota pallida Lindl., Bot. Reg. 21: sub t.1777. 1835; Hook. f., Fl. Brit. India 5: 857. 1890; Bose *et al.* Orch. India. 393. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 353. 2002; Lucksom, Orch. Sikkim N.E. Himal. 510. t. 524. 2007; Misra, Orch. India. 313. 2007; Yonzzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1547. 2012.

Pholidota calceata Rchb. f., Bonplandia 4: 329. 1856; Pradhan, Indian Orch. Guide Identif. Cult. 2: 292. 1979.

Coelogyne calceata (Rchb. f.) Rchb. f., Walpers. Ann. Bot. Syst. 6: 238. 1861.

Pholidota imbricata sensu Hook. f., Fl. Brit. India 5(2): 845. 1890.

P. imbricata var. *sessilis* Hook. f., op. cit. 846. 1890.

P. yunnanensis sensu Schltr., Feddes Repert. Spec. Nov. Regni Veg. 19: 378. 1924.

P. yunpeensis Hu, Rhodora 27: 107. 1925.

P. schlechteri Gagnep., Bull. Mus. Natl. Hist. Nat. ser.2, 3: 147. 1931.

P. tixieri Guillaumin, op. cit. 28: 548. 1956.

P. pallida var. *sessilis* (Hook. f.) Sarkar, J. Econ. Taxon. Bot. 5(5): 1008. 1984.

Plant epiphytic herb, 11-37 cm tall. Pseudobulbs 3.5-6 × 1.3-2 cm long, slender to swollen, sheathed. Leaf solitary, 14-31 × 2.5-5 cm, oblong to linear-lanceolate, acuminate. Inflorescence synanthous, densely many-flowered; peduncle 7-12 cm long, narrowly wiry; rachis 5-13 cm long; pedicellate-ovary 1.8-3 mm long. Flowers 5-6 mm across, white or creamy-white, arranged in two rows; floral bracts minute. Sepals sub-equal, white; dorsal sepal 3.4-4.5 × 2.5-3.4 mm, semi-elliptic to ovate, obtuse, forming a hood with the petals; lateral pair 4-5.5 × 2-2.5 mm, ovate-oblong, acute to apiculate, connate at base. Petals 3.3-4.5 × 0.9-1.2 mm, slightly falcate, obtuse to acute. Lip 4-5 mm long, 3-lobed; side lobes erect, broadly rounded; apical lobe 2-lobed, lobes semi-orbicular; disc with 3 short, wing-like keels at base. Column 2.7-3.2 × 1.8-2.5 mm, wide, wing-like, spathulate. Anther 2-chambered; pollinia 4.

Flowering : June – September; Fruiting: August – October.

Specimen cited : Samalbung Busty 900 m, **Rajendra Yonzzone, D. Lama and R. B. Bhujel 1301**, dt. 07. 07. 2010.

Status : Sparse

Local distribution : Relli-Pala, Lathpanjar, Kalijhora, Kurseong, Sittong, Sinjee, 800 – 1100 m.

General distribution : Nepal, India, Myanmar, China, Thailand, Laos and Vietnam.

Pholidota recurva Lindl., Gen. Sp. Orchid. Pl.: 37. 1830; Hook. f., Fl. Brit. India 5: 857. 1890; Bruhl, Guide Orch. Sikkim. 98. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 293. 1979; Bose *et al.* Orch. India. 393. 1999; Pearce & Cribb, Fl.

Bhutan, 3(3): 351. 2002; Lucksom, Orch. Sikkim N.E. Himal. 512. t. 526, pl. 21. 2007; Misra, Orch. India. 313. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1547. 2012.

Coelogyne recurva (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 237. 1861.

Plant epiphytic herb, 17-47 cm long. Pseudobulbs 4.3-8 × 1.2-1.4 cm, swollen, slender, sheathed. Leaves 2, 5-9 × 1.2-2 cm, linear-lanceolate, acute, petiolate. Inflorescence 4.5-10 cm, synanthous, 20 to 31-flowered; peduncle 1-2.5 cm long; rachis 3.5-7.5 cm long, curved; pedicellate-ovary 4-5 × 1-1.2 mm long. Flowers 4-6 mm across, secund, pale pinkish-brown to orange-brown; floral bracts semi-elliptic. Dorsal sepal 3.6-4.2 × 1.9-2.4 mm, ovate, obtuse; lateral pair 3.6-4.2 × 2.2-2.4 mm, ovate to ovate-oblong, acute to apiculate. Petals 2.9-3.4 × 1-1.3 mm, ovate-oblong, obtuse. Lip 3.9-4.2 × 3-4 mm long; hypochile wide, concave; hypochile base with 3 swollen keels; epichile slightly 2-lobed. Column 2.4-2.8 mm long, clavate, hooded.

Flowering : August – September; Fruiting: September – October.
Specimen cited : Todey forest 1400 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1453**, dt. 31. 08. 2010.
Status : Rare.
Local distribution : Baggonra, Badamtam, Tangta forest, Echey Busty, 600 – 2000 m.
General distribution : India (North East India, Sikkim, West Bengal); Bhutan, Myanmar, Nepal, Thailand, Vietnam.

Pholidota rubra Lindl., Gen. Sp. Orchid. Pl.: 37. 1830; Hook. f., Fl. Brit. India 5: 857. 1890; Bruhl, Guide Orch. Sikkim. 97. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 293. 1979; Hedge, Orch. Arun. Pradh. 51. 1984; Pearce & Cribb, Fl. Bhutan, 3(3): 351. 2002; Lucksom, Orch. Sikkim N.E. Himal. 513-514. t. 529. 2007; Misra, Orch. India. 313. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1547. 2012.

Pholidota undulata Lindl., Bot. Reg. 14: 1213. 1829, *nom. nud.*; Gen. Sp. Orchid. Pl. 37. 1830; Bose *et al.* Orch. India. 395. 1999.

Coelogyne rubra (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 238. 1861.

C. undulata (Lindl.) Rchb. f., *loc. cit.* 1861. [Plate 4.24. B]

Plant epiphytic herb, 18-39 cm tall. Pseudobulbs 3.5-8.5 cm long, cylindrical, bulging below the center, tapering to each end, sheathed. Leaves 2, 11-24 × 1.7-4.2 cm, linear-lanceolate, acuminate, petiolate. Inflorescence proteranthous to synanthous, 26 to 57-flowered, pendent; rachis 11-23 cm long; pedicel and ovary 3-6.5 mm long. Flowers 1-1.2 cm across, dull pale suffused with yellowish-green; floral bracts ovate to elliptic. Dorsal sepal 4.3-5.4 × 2.2-3.5 mm, ovate, acute to acuminate; lateral pair 4.5-6 × 2.5-3.2 mm, ovate to obliquely elliptic, acute to acuminate, recurved to reflexed. Petals 4.3-5.3 × 0.5-0.8 mm, linear-lanceolate, subacute. Lip 4-5.6 mm

long; hypochile broadly ovate; epichile reflexed to recurved, semi-orbicular to ovate, apex apiculate. Column 3-4 mm long, slender, hooded. Pollinia 4.

- Flowering : October – December; Fruiting: November – January.
Specimen cited : Algarah forest 1700 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1731**, dt. 06. 11. 2011.
Status : Sparse.
Local distribution : Lava, Mungpoo, Ghoomty Tea Garden, Charkhol, 900 – 2200 m.
General distribution : India (North East India, Sikkim, West Bengal); Bhutan, Vietnam.

Pleione D. Don

Plant small epiphytic or lithophytic herb. Pseudobulbs clustered, ovoid, conical, pyriform. Leaf solitary or 2, from apex of pseudobulbs, deciduous, erect to curved-spreading, plicate, shortly petiolate. Inflorescence basal, erect, solitary or 2 flowered. Flowers showy, sometimes fragrant. Sepals and petals free, spreading. Lip weakly 3-lobed to entire, apical margins erose to lacerate; callus of 2 to several lines of lamellae or hairs along nerves of upper surface of lip. Column slender, slightly curved, winged above, entire, erose or denticulate at apex. Anther ovate; pollinia 4.

The genus *Pleione* D. Don, comprises about 16 species distributed from central Nepal, Eastwards to North East India, Myanmar, China, Taiwan, Thailand and Laos.

Key to the species

1. Pseudobulbs ovoid, gradually narrowed into a beak; leaf solitary.....2
 - 1a. Pseudobulbs turbinate, abruptly contracting into a beak; 2-leaved.....3
2. Leaf and flower existing at the same time; flowers
purplish-white; lip not saccate at base *P. hookeriana*
- 2a. Leaf and flower not existing at the same time;
flower white; lip saccate at base *P. humilis*
3. Pseudobulbs covered with white warts; flowers
white streaked with reddish-purple; lip oblong *P. maculata*
- 3a. Pseudobulbs covered with greenish warts;
flowers white suffused with purple; lip elliptic *P. praecox*

Pleione hookeriana (Lindl.) B.S. Williams, Orch.-Grow. Man. ed.6: 548. 1885; Cribb *et al.* Curtis's Bot. Mag. 184: 113, t. 862. 1983; Tuyama in Hara, Fl. E. Himal. 1: 448. 1966; Tuyama in Hara, Fl. E. Himal. 2: 193-194. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 280. 1979; Banerji, Orch. Nepal. 85. 1982; Hedge, Orch. Arun. Pradh. 51. 1984; Deva & Naithani, Orch. N.W. Himal. 335 – 337. t. 336. 1986; Tuyama in Ohashi, Fl. E. Himal. 3: 164. 1975; Pradhan & Pradhan, 100 Beaut. Orch. 112. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 610. 1998; Bose *et al.* Orch. India. 404. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 355-357, t. 356. 2002; M. Pradhan, 100 N.E. Indian Orch. 96-97. 2006; Lucksom, Orch. Sikkim N.E. Himal. 503-504. t. 515, pl. 20. 2007; Misra, Orch. India. 314. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1548. 2012; *et Env. Eco.* 30(2): 341. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 268. 2013. *Coelogyne hookeriana* Lindl., Fol. Orchid. Coelogyne 5: 14, no.37. 1854; Hook. f., Fl. Brit. India 5: 842. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 139, t. 193. 1898; Bruhl, Guide Orch. Sikkim. 92. 1926. *C. hookeriana* var. *brachyglossa* Rchb. f., Gard. Chron. ser.3, 1: 833. 1887. *Pleione hookeriana* var. *brachyglossa* (Rchb. f.) Rolfe, Orchid Rev. 11: 291. 1903. *P. laotica* Kerr, J. Siam Soc., Nat. Hist. Suppl. 9: 235. 1933. *P. milanii* Braem, Orchidees, Culture & Protection 38: 23. 1999. [Plate 4.24. C]

Plant epiphytic herb, 6-10 cm tall. Pseudobulbs 1.7-3 × 0.75-1.6 cm, conical to ovoid, sheathed. Leaf solitary, 6-13 × 1.7-2.8 cm, elliptic-lanceolate, acute, petiolate. Inflorescence solitary flowered; peduncle 6-8 cm long, slender; pedicellate-ovary 1.2-1.8 cm long. Flowers 3-6.7 cm across, purplish-white; floral bracts ovate-elliptic. Dorsal sepal 2.8-3.2 × 0.9-1.1 cm, elliptic-oblong, obtuse; lateral pair 2.5-2.9 × 0.9-1.2 cm, oblong, acute, falcate. Petals 2.9-3.4 × 0.7-0.8 cm, oblanceolate, acute. Lip 2.7-3 × 1.9-3.8 cm, obscurely 3-lobed, yellow disc and lamellae, spotted with purple or yellowish-brown, reniform, emarginated, margins denticulate. Column 1.8-2.1 cm long, winged above, dentate at tip. Anther dome shaped; pollinia 4.

Flowering : May – July; Fruiting: June – August.
 Specimen cited : Gorkhey forest 2600 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0469**, dt. 29. 05. 2008.
 Status : Sparse.
 Local distribution : Sandakphu, Phalut, Kalpokhari, Tonglu, Samenden, Gorkhey, 2100 – 3600 m.
 General distribution : India (North East India, Sikkim, West Bengal); Bhutan, China, Laos, Myanmar, Thailand.

Pleione humilis (J.E. Sm.) D. Don, Prodr. Fl. Nepal.: 37. 1825; Tuyama in Ohashi, Fl. E. Himal. 3: 164. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 280. 1979; Banerji, Orch. Nepal. 85. 1982; Hedge, Orch. Arun. Pradh. 51. 1984; Deva & Naithani, Orch. N.W. Himal. 337. t. 338. 1986; Pradhan & Pradhan, 100 Beaut.

Orch. 113. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 610. 1998; Bose *et al.* Orch. India. 404. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 357. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 118-119. 2005; Lucksom, Orch. Sikkim N.E. Himal. 504. t. 516, pl. 20. 2007; Misra, Orch. India. 314. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1548. 2012; *et Env. Eco.* 30(2): 341. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 270. 2013.

Epidendrum humile J.E. Sm., Exot. Bot. 2: 75, t.98. 1806.

Coelogyne humilis (J.E. Sm.) Lindl. coll. Bot.: sub t.37. 1821; Hook. f., Fl. Brit. India 5: 840. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 139, t. 194. 1898; Bruhl, Guide Orch. Sikkim. 92. 1926.

C. humilis var. *tricolor* Rchb. f., Gard. Chron. n.s. 13: 394. 1880.

C. humilis var. *albata* Rchb. f., op. cit. ser.3, 3: 392. 1888.

Pleione humilis var. *adnata* Pfitz., Engler. Pflanzent. (IV.50) Coelog.: 121. 1907.

P. humilis var. *purpurascens* Pfitz., op. cit. 122. 1907.

P. diantha Schltr., Orchis 9: 44. 1915.

P. humilis var. *pulchella* E.W. Cooper, Roy. Hort. Soc. Dict. Gard. 3: 1606. 1951.

Plant epiphytic herb, 6.5-11 cm tall. Pseudobulbs 2-4.5 × 0.9-2 cm, ovoid-conical, tapering to apex. Leaf solitary, 18-25 × 2.8-3.5 cm, oblanceolate, acute, absent during anthesis. Inflorescence 1 or 2-flowered; peduncle enclosed by scariosus sheaths; pedicellate-ovary 2.3-2.8 cm long. Flowers 6-7 cm across, white; floral bracts obovate. Sepals and petals white. Dorsal sepal 3.5-4.4 × 0.6-0.7 cm, oblong-oblanceolate, subacute; lateral pair 4-4.3 × 0.7-0.9 cm, narrowly oblanceolate. Petals 3.6-4.5 × 0.5-0.7 cm, narrowly oblanceolate, obtuse. Lip 3.7-4.6 × 2.6-3.4 cm, 3-lobed, elliptic, whitish-yellow with yellowish brown stripes and spots on disc, emarginated, saccate at base; side lobes erect-incurved. Column 2.5-2.9 cm long, winged. Anther ovate; pollinia 4.

Flowering : January – March; Fruiting: February – April.

Specimen cited : Chetray (Border area of Nepal and India) 2500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0296**, dt. 10. 04. 2008.

Status : Sparse.

Local distribution : Manaybhanjang, Kalpokhari, Neora Valley, Bikhaybhanjang, Gairibas, Tangta, Tonglu, Gorkhey, Phalut Valley, Serikhola, 1800 – 3300 m.

General distribution : India (North East India, Sikkim, West Bengal); Bhutan, Myanmar, Nepal.

Pleione maculata (Lindl.) Lindl., Paxt., Fl. Gard. 2: 5, t.39. 1851; Cribb *et al.* Curtis's Bot. Mag. 184: 106, t. 860. 1983; Tuyama in Hara, Fl. E. Himal. 2: 194. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 281. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 114. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 615. 1998; Bose *et al.* Orch. India. 406. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 357-358. 2002; M.

Pradhan, 100 Sikkim Himal. Orch. 120-121. 2005; Lucksom, Orch. Sikkim N.E. Himal. 505. t. 518, pl. 20. 2007; Misra, Orch. India. 314. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1548. 2012; *et* Env. Eco. 30(2): 341. 2012.

Coelogyne maculata Lindl., Gen. Sp. Orchid. Pl.: 43. 1830; Hook. f., Fl. Brit. India 5: 841. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 140, t. 195. 1898; Bruhl, Guide Orch. Sikkim. 93. 1926.

Pleione diphylla Lindl., Paxton's Fl. Gard. 2: 66. 1851.

Coelogyne diphylla (Lindl.) Lindl., Fol. Orchid. *Coelogyne* 5: 15, no.38. 1854.

C. arthuriana Rchb. f., Gard. Chron. n.s. 15: 40. 1881.

C. maculata var. *virginica* Rchb. f., op. cit. ser.3, 2: 682. 1887.

Gymnostylis candida Wall. *ex* Pfitz., Engler, Pflanzenr. (IV.50) Coelog.: 127. 1907.

Pleione maculata var. *arthuriana* (Rchb. f.) Rolfe *ex* Kranz., op. cit. 128. 1907.

P. maculata var. *virginica* (Rchb. f.) S. Karthikeyan, Fl. Ind. Enumerate.-Monocot.: 166. 1989.

Plant epiphytic herb, 10-23 cm tall. Pseudobulbs 2-3.4 × 1.5-2 cm, covered with white warts, sheathed. Leaves 2, 7-23 × 2-3.9 cm, elliptic-lanceolate, acute. Inflorescence solitary flowered; peduncle sheathed; pedicellate-ovary 1.8-2 cm long. Flowers 4-6 cm across, white streaked with reddish-purple; floral bracts suborbicular. Dorsal sepal 3.5-4.5 × 0.7-0.9 cm, oblong-lanceolate, obtuse; lateral pair 3.4-4 × 0.6-0.9 cm, broadly lanceolate-falcate, acute. Petals 3.6-4.5 × 0.7-0.9 cm, oblanceolate, slightly falcate. Lip 3-3.6 × 2.5-2.7 cm, 3-lobed, white marked with purple and yellow, oblong; side lobes obscure; apical lobe emarginated, margin undulate-erose; callus of 5 to 7-lamellae. Column 1.8-2 cm long, erose-dentate at tip. Anther ovate; pollinia 4.

Flowering : October – November; Fruiting: November – December.

Specimen cited : Pankhabari 500 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1504**, dt. 18. 10. 2010.

Status : Threatened.

Local distribution : Mirik, Mungpoo, Rangayrung, Munsong, 500 – 1800 m.

General distribution : India (North East India, Sikkim, West Bengal); Bhutan, South West China, Thailand.

Pleione praecox (J.E. Sm.) D. Don, Prodr. Fl. Nepal.: 37. 1825; Tuyama in Hara, Fl. E. Himal. 1: 449. 1966; Tuyama in Hara, Fl. E. Himal. 2: 194. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 164. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 281. 1979; Banerji, Orch. Nepal. 85-86. 1982; Deva & Naithani, Orch. N.W. Himal. 337 – 341. t. 339. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 115. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 615. 1998; Bose *et al.* Orch. India. 406. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 358. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 122-123. 2005; *et* 100 N.E. Indian Orch. 98-99. 2006; Lucksom, Orch. Sikkim N.E.

Himal. 504-505. t. 517, pl. 20. 2007; Misra, Orch. India. 314. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1548. 2012; *et* Env. Eco. 30(2): 341. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 272. 2013.

Epidendrum praecox J.E. Sm., Exot. Bot. 2: 73, t.97. 1806.

Coelogyne praecox (J.E. Sm.) Lindl., Coll. Bot.: sub t.37. 1821; Hook. f., Fl. Brit. India 5: 840. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 141, t. 196. 1898; Bruhl, Guide Orch. Sikkim. 93. 1926.

C. praecox var. *sanguinea* Lindl., Fol. Orchid. Coelogyne 5: 16, no.42b. 1864.

Pleione praecox var. *candida* Pfitz., Engler, Pflanzent. (IV.50) Coelog.: 126. 1907. [Fig. 4.19]

Plant epiphytic or lithophytic herb, 9-18 cm tall. Pseudobulbs 1.7-2.9 × 2.2-2.6 cm, contracted above into a beak, green mottled with reddish-brown or purplish. Leaf solitary or 2, 8-19 × 3.5-6 cm, elliptic-lanceolate, acuminate, petiolate, sheathed at base. Inflorescence 1 (rarely 2)-flowered; peduncle sheathed; pedicellate-ovary 1.8-2.6 × 0.2-0.3 cm. Flowers white suffused with purple; floral bracts elliptic. Sepals similar, narrowly oblong-lanceolate, acute; dorsal sepal 5.5-6.2 × 0.8-1.3 cm; lateral pair 5.5-6.3 × 1.1-1.4 cm. Petals 5-5.7 × 0.7-0.9 cm, slightly falcate, narrow lanceolate, acute. Lip 4.6-5 × 3.9-4.3 cm, 3-lobed, yellow lamellae on disc, elliptic; apical lobe emarginated, dentate-lacerate; callus of 3-5 papilose keels. Column 3.8-4.2 × 0.7-1.1 cm, slender, dentate at apex. Anther white; pollinia 4.

Flowering	: September – November; Fruiting: October – December.
Specimen cited	: Tangta Busty 2300 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0181 , dt. 27. 10. 2007.
Status	: Sparse.
Local distribution	: Lava, Sukiapokhari, Baggonra, Senchal, Charkhol; Toroyok, Manaybhanjang, Happy Valley-Darjeeling, Dali-Darjeeling, Jalapahar, Rambhi forest, Senchale, 1800 – 2400 m.
General distribution	: India (North East India, Sikkim, West Bengal); Bhutan, China, Myanmar, Nepal, Thailand.

Tribe **Podochileae** Pfitz.

Subtribe **Agrostophyllinae** Szlach.

Agrostophyllum Bl.

Plants perennial epiphytic herbs with sheathed compressed stems bilaterally flattened, leafy, internodes numerous, pseudobulbs absent. Leaves many, distichous, linear, with large flattened persistent sheaths. Inflorescence terminal heads. Flowers very small, white, resupinate, numerous on membranously sheathed pedicels, crowded in dense small almost sessile terminal heads. Sepals and petals similar, free; lateral pair forming a mentum which contains the saccate lip base. Lip 3-lobed, adnate to the column of to its foot, short, erect. Column short stout. Anther 2-celled; pollinia 8.

The genus *Agrostophyllum* Bl., comprises about 50 species distributed from the Seychelles and tropical Asia to the Pacific Islands.

Key to the species

1. Stems of same thickness throughout;
heads of flowers more than 2.5 cm diam.....2
- 1a. Stems increasing in thickness from the base
upwards; heads of flowers not more than 2 cm diam.....3
2. Flowers yellowish; callus on lip simple *A. myrianthum*
- 2a. Flowers reddish-purple; callus on lip divided *A. callosum*
3. Stem tufted; lip clawed; mentum spur-like;
column foot absent *A. planicaule*
- 3a. Stems spaced; lip not clawed;
mentum not spur like; column foot present *A. brevipes*

Agrostophyllum brevipes King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 156, t.213. 1898; Bruhl, Guide Orch. Sikkim. 100. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 433. 1979; Hedge, Orch. Arun. Pradh. 55. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 51-53. 1998; Bose *et al.* Orch. India. 83. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 360. 2002; Lucksom, Orch. Sikkim N.E. Himal. 532. t. 540, pl. 22. 2007; Misra, Orch. India. 280. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 452. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* Biosc. Disc. 3(2): 174. 2012.

Agrostophyllum callosum sensu Hook. f., Fl. Brit. India 5(2): 824. 1890, non Rchb. f.

Plant epiphytic rhizomatous herb, 18-38 cm tall. Stem stout. Leaves 3-5, 5-15 × 0.5-1 cm, 3 or 4, arising from apex of stem, alternate, linear-oblong, tip emarginated, subacute, base sessile, sheathing. Inflorescence in terminal heads, 1.1-1.4 cm long, globose, densely many-flowered; pedicellate-ovary 4-5 mm long. Flowers 4-5 mm across, white; floral bracts lanceolate. Sepals and petals. Sepals 3-3.6 × 2.2-2.7 mm, subsimilar, lanceolate-ovate, acute; lateral pair 3-3.7 × 2.4-2.8 mm. Petals 2.8-3 × 1.6-1.9 mm, suborbicular to ovate, acute. Lip 3-4 mm long, 3-lobed, white, oblong; side lobes rounded; apical lobe oblong, emarginated; disc with a central callus and 2 smaller, conical calluses below. Column 0.8-1 mm long, apex winged; foot short. Anther cordate, white reddish-purple; pollinia 8, clavate.

Flowering	: May – June; Fruiting: June – August.
Specimen cited	: 27 th Mile, Teesta N.H.P.C. Power Project side 400 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1181 , dt. 23. 05. 2010
Status	: Sparse.
Local distribution	: Algarah forest, Panbu, Seokbir Khani, Sittong, 400 – 1600 m.
General distribution	: India, (North East India, Sikkim, West Bengal), Laos, Vietnam.

Agrostophyllum callosum Rchb. f., Seeman, Fl. Vit.: 296. 1868; Hook. f., Fl. Brit. India 5: 824. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 155, t. 212. 1898; Bruhl, Guide Orch. Sikkim. 100. 1926; Tuyama in Hara, Fl. E. Himal. 1: 425. 1966; Tuyama in Hara, Fl. E. Himal. 2: 177. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 434. 1979; Banerji, Orch. Nepal. 47. 1982; Hedge, Orch. Arun. Pradh. 55. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 53. 1998; Bose *et al.* Orch. India. 83. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 360 & 362, t. 361. 2002; Luckson, Orch. Sikkim N.E. Himal. 533. t. 542, pl. 22. 2007; Misra, Orch. India. 280. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 452. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* Biosc. Disc. 3(2): 174. 2012.

Plant epiphytic rhizomatous herb, 23-45 cm tall. Stem wider at apex than base, sheathed. Leaves 9-13, 6-17 × 0.9-1 cm, alternate, linear-oblong, tapering gradually to emarginated tip, tip bifid, sessile, sheathing at base. Inflorescence 2.6-2.9 cm across, capitate-globose, densely many-flowered; pedicellate-ovary 7-8 mm long. Flowers 4-6 mm long, reddish-purple; floral bracts ovate. Sepals, petals and lip reddish-purple. Sepals 3 × 1.6 mm, similar, ovate, obtuse. Petals 2 × 1.5 cm, broadly elliptic, obtuse. Lip 3-lobed; side lobes rounded; apical lobe decurved, reniform, emarginated; disc with basal callus, divided into 2 diverging, cylindrical lobes. Column 0.9-1.1 mm long, stout; foot short. Anther dark-purple; pollinia yellow.

Flowering	: March – June; Fruiting: May – July.
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Specimen cited : Lungshel forest 450 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0345**, dt. 27. 04. 2008.
 Status : Common.
 Local distribution : Lava, Nokdara, Algarah, Kafer, Lopchu, Rambi forest, Lopchu, 600 – 2200 m.
 General distribution : India (North East India, Sikkim, West Bengal); Bhutan, China, Nepal, Thailand.

Agrostophyllum myrianthum King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 155, t. 211. 1898; Chowdhery, Orch. Fl. Arun. Pradh. 53. 1998; Bruhl, Guide Orch. Sikkim. 100. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 434. 1979; Bose *et al.* Orch. India. 83. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 362. 2002; Lucksom, Orch. Sikkim N.E. Himal. 532-533. t. 541. 2007; Mishra, Orch. India. 280. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 452. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* Biosc. Disc. 3(2): 174. 2012.

Plant epiphytic herb, 37-46 cm tall; rhizomatous. Stems widening from base to tip. Leaves 7-13, 8-12 × 0.8-1.3 cm, alternate, linear-oblong, obtuse, sessile, sheathing. Inflorescence 2.8-3 cm across, globose, densely many-flowered; pedicellate-ovary 0.8-1 cm long. Flowers 2.8-3 mm across, yellow; floral bracts narrowly ovate. Sepals similar; dorsal sepal 2.7-3 × 0.8-1 mm, ovate-orbicular, obtuse, concave; lateral pair 2.8-3 × 0.9-1.1 mm. Petals 2.8-3 × 0.2-0.3 mm, oblong-ovate, obtuse. Lip 2.7-3 mm long, 3-lobed, oblong; side lobes rounded; apical lobe broadly ovate; disc with a central callus. Column 0.8-1 mm long; foot short. Anther ovate; pollinia 8.

Flowering : July – August; Fruiting: August – September.
 Specimen cited : Kumsi forest 760 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1429**, dt. 17. 08. 2010.
 Status : Sparse.
 Local distribution : Teesta River sides, Rambi, Rambi, Solok, Sepkhola, Pareng, Sendaybong, 200 – 1600 m.
 General distribution : India (North East India, Sikkim, West Bengal).

Agrostophyllum planicaule (Wall. *ex* Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 909. 1864; Pearce & Cribb, Fl. Bhutan, 3(3): 362. 2002; Lucksom, Orch. Sikkim N.E. Himal. 531-532. t. 539. 2007; Misra, Orch. India. 280. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 452. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* Biosc. Disc. 3(2): 174-175. 2012.

Eria planicaulis Wall. *ex* Lindl., Bot. Reg. 26: 8, misc.8, no.4. 1840.

Agrostophyllum khasianum Griff., Calcutta J. Nat. Hist. 4: 376, t. 19. 1844; Hook. f., Fl. Brit. India 5: 824. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 154, t. 210. 1898; Chowdhery, Orch. Fl. Arun. Pradh. 53. 1998; Bruhl, Guide Orch. Sikkim. 99. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 433. 1979; Hedge, Orch. Arun. Pradh. 55. 1984; Bose *et al.* Orch. India. 83. 1999.

Appendicula hasseltii sensu Wight, Icon. Pl. Ind. Orient. 5: 20. 1852, non Bl.
Agrostophyllum hasseltii sensu (Wight) Rchb. f., Walpers, Ann. Bot. Syst. 6: 909.
1864, non (Bl.) J.J. Sm.

Plant epiphytic herb, 23-33 cm tall. Stems 7-10 cm long, fusiform, compressed, sheathed. Leaves 3 or 4, 7-14.5 × 1.6-2.2 cm, terminal, distichous, alternate, narrowly ovate-oblong, tapering to each end, obtuse to minutely emarginated, petiolate. Inflorescence 2-2.3 cm across, globose-capitate, densely many-flowered; peduncle short; pedicellate-ovary 6-7 mm long. Flowers 4-5 mm across, white; floral bracts fibrous-membranous. Sepals and petals white. Sepals subsimilar, ovate-oblong, acute; dorsal sepal 2.4-3.2 × 1.5-1.6 mm; lateral pair 2.5-3.5 × 1.8-2 mm, oblong, acuminate, saccate. Petals 2-2.6 × 0.5-0.6 mm, narrowly linear-oblong, acute, margins recurved. Lip 3-5 mm long, clawed; base saccate; apical lobe broad, emarginate at apex, margins undulate; mentum spur-like. Column 0.8-1 mm long, broad, 2 fleshy, horn-like projections at base. Anther ovate; pollinia 8.

Flowering : July – August; Fruiting: August – October.
Specimen cited : Kalijhora forest 500 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0652**, dt. 12. 08. 2008.
Status : Threatened.
Local distribution : Saureni, Kumsi, Sittong, Nimbong, Pudung,
400 – 2000 m.
General distribution : India (North East India, Sikkim), Myanmar, South
East Asia, Nepal.

Subtribe **Eriinae** Benth.

Ceratostylis Bl.

Plants epiphytic herbs. Pseudobulbs absent. Stems crowded, simple and rush-like or branched, sheathed. Leaf solitary, narrow, coriaceous, fleshy to subterete. Flowers minute, resupinate, small, solitary to few within a cluster of bracts. Sepals subequal, connivent; lateral pair forming a saccate or spur-like mentum. Petals narrower than the sepals. Lip adnate to column foot by a long, incumbent claw, entire, usually with longitudinal calluses. Column short, deeply 2-lobed or with 2 spatulate, erect arms; foot long. Anther dorsal; pollinia 8.

The genus *Ceratostylis* Bl., comprises about 100 species distributed from India and South East Asia to Indonesia and New Guinea.

Key to the species

1. Stems branched; leaves fleshy,
linear-lanceolate; column undivided..... *C. himalaica*
- 1a. Stems unbranched, rush-like;
terete leaf at tip; column deeply divided.....*C. subulata*

Ceratostylis himalaica Hook. f., Fl. Brit. India 5(2): 826. 1890; Hook. f., Fl. Brit. India 5: 857. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 431. 1979; Hedge, Orch. Arun. Pradh. 55. 1984; Pearce & Cribb, Fl. Bhutan, 3(3): 363, t. 364. 2002; Lucksom, Orch. Sikkim N.E. Himal. 536-537. t. 547, pl. 22. 2007; Misra, Orch. India. 286. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1538. 2012.

Eria ramosissima Wall. *ex* Hook. f., Fl. Brit. India 5(2): 826. 1890.

Ritaia himalaica (Hook. f.) King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 157, t.214. 1898.

Plant epiphytic herb, 8-20 cm tall. Stems pendent, branched, sheathed. Leaf solitary, 4-9 × 0.3-0.7 cm, fleshy, linear-lanceolate, tip obliquely notched, acute, petiolate. Inflorescence arising from leaf base, subcapitate, 2-flowered; peduncle sheathed; pedicellate-ovary hairy. Flowers 3-4 mm across, pale-yellow, suffused with purple, hairy externally; floral bract ovate. Dorsal sepal 2.8-3 × 0.8-1.5 mm, ovate-lanceolate, concave, subacute; lateral pair 2.7-3 × 3.5-4 mm, broadly ovate-lanceolate, acuminate, incurved, connate at base to form a mentum. Petals 3-3.2 × 0.8-1 mm, linear, acute. Lip 3-3.3 mm long, yellow, simple, suborbicular, emarginated. Column 1-1.4 mm long; foot short. Anther ovate; pollinia 8.

Flowering : April – June; Fruiting: May – August.

Specimen cited : Mirik 1300 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1164**, dt. 10. 05. 2010.

Status : Threatened.

Local distribution : Today, Dowhill-Kurseong, Sonada, 1200–2000 m.

General distribution : India (North East India, Sikkim); Bhutan, Nepal.

Ceratostylis subulata Bl., Bijdr.: 306. 1825. Chowdhery, Orch. Fl. Arun. Pradh. 181-184. 1998; Bose *et al.* Orch. India. 144. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 363 & 365. 2002; Lucksom, Orch. Sikkim N.E. Himal. 537. t. 548, pl. 23. 2007; Misra, Orch. India. 286. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1538. 2012.

Appendicula teres Griff., Not. Pl. Asiat. 3: 359. 1851.

Ceratostylis teres (Griff.) Rchb. f., Bonplandia 2: 89. 1854; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta): 247, t. 329. 1898; Bruhl, Guide Orch. Sikkim. 146. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 431. 1979.

C. cepula Rchb. f., *op. cit.* 5: 53. 1857.

C. gracilis sensu Rchb. f., *Xenia* Orchid. 2: 92. 1863, *non* Bl.

C. malaccensis Hook. f., Fl. Brit. India 5(2): 825. 1890.

Plant epiphytic herb, 13-25 cm tall. Stems unbranched, sheathed. Leaf solitary, 2.5-3 cm long, terete, subterete, grooved on one side, arising from stem apex. Inflorescence, 1.2-2.7 × 0.2-0.4 cm, terminal, capitate, sessile; peduncle 2-3 × 1.5-2 mm, sheath; pedicellate-ovary puberulent. Flowers 2.5-3 mm across, light yellow, sparsely hairy; floral bracts minute. Sepals and petals yellow. Dorsal sepal 2.8-3 × 1-1.3 mm, ovate-lanceolate, subacute, apex recurved, spreading; lateral pair 3 × 1.2 mm, similar, connate to form a mentum. Petals 2-2.8 × 1-1.4 mm, oblong-lanceolate, acute. Lip 2.9-3.5 × 1.5 mm, simple, spathulate, narrow at base, obtuse at apex; disc with 2 lamellae; foot long. Column 1.4 mm long, deeply divided. Anther cordate; pollinia 8.

Flowering : May – July; Fruiting: June – September.

Specimen cited : Panbu forest 650 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1328**, dt. 13. 07. 2010.

Status : Rare.

Local distribution : Majitar, Kumai, Nimbong, Sepkhola, Kambal, 400 – 800 m.

General distribution : India (North East India, Sikkim); China, Borneo, Java, Malaysia, South East Asia, Sumatra.

Cryptochilus Wall.

Plants perennial epiphytic herbs. Pseudobulbs crowded, ovoid or cylindrical. Leaves 2, arising from tip of pseudobulb, coriaceous, petiolate. Inflorescence terminal, racemes; floral bracts exceeding flowers. Flowers more than 5. Sepals connate to form a subcylindric to urceolate tube, the acute apices free. Petals similar, not connate. Lip simple, adnate to the short foot of the column. Column erect, slightly dilated at apex. Anther 2 or 4-celled; pollinia 8.

The genus *Cryptochilus* Wall., comprises 2 species distributed from North India to Indo-China.

Key to the species

1. Pseudobulbs cylindrical; inflorescence shorter than the leaves; flowers less than 1 cm long; sepaline tube yellow; pollinia yellow..... *C. lutea*

- 1a. Pseudobulbs ovoid; inflorescence longer than the leaves; flowers more than 1 cm long; sepaline tube scarlet; pollinia green.....*C. sanguinea*

Cryptochilus lutea Lindl., J. Proc. Linn. Soc., Bot. 3: 21. 1858; Hook. f., Fl. Brit. India 5: 827. 1890; King & Pantl. in Ann. Roy. Bot. Gard. (Calcutta) 8: 163, t. 221. 1898; Bruhl, Guide Orch. Sikkim. 102. 1926; Tuyama in Ohashi, Fl. E. Himal. 3: 140. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 368. 1979; Banerji, Orch. Nepal. 54. 1982; Hedge, Orch. Arun. Pradh. 52. 1984; Deva & Naithani, Orch. N.W. Himal. 237 – 240 t. 239. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 55. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 248. 1998; Bose *et al.* Orch. India. 172. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 365 & 367, t. 366. 2002; Lucksom, Orch. Sikkim N.E. Himal. 534. t. 543, pl. 22. 2007; Misra, Orch. India. 290. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012.

Cryptochilus farreri Schltr., Feddes Repert. Spec. Nov. Regni Veg. 20: 384. 1924.

Plant epiphytic herb, 11-23 cm tall. Pseudobulbs 1.9-2.4 × 0.4-0.7 cm, clustered, cylindric, sheathed. Leaves 2, 9-19 × 1.8-2.5 cm, elliptic, acute, fleshy, petiolate. Inflorescence 20 to 38-flowered; peduncle 4-7 cm long, glabrous, slender; rachis 3.8-7.3 cm long; pedicellate-ovary 4-5 mm long, hairy. Flowers 5-7 mm long, secund, yellow; floral bracts linear-lanceolate. Sepals similar, 4-5 mm long, connate, forming an urceolate sepaline tube, apices triangular-acute, free. Petals 3-4 mm long, obliquely rhombic, narrowed at base. Lip 3-4 mm long, simple, oblong, curved at base, thickened towards apex. Column short, apex bifid; foot narrow. Anther 2 chambered; pollinia 8.

- Flowering : March – June; Fruiting: May – July.
 Specimen cited : Tangta forest 2600 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0411**, dt. 21. 05. 2008.
 Status : Rare.
 Local distribution : Rachela, Megma, Kafer, Samalbong, Megma, Palmajua, 1100 – 2900 m.
 General distribution : India (North India, Sikkim, West Bengal).

Cryptochilus sanguinea Wall., Tent. Fl. Nepal 2: 36, t.26. 1826; Hook. f., Fl. Brit. India 5: 827. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 163, t. 220. 1898; Bruhl, Guide Orch. Sikkim. 102. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 367. 1979; Banerji, Orch. Nepal. 54. 1982; Hedge, Orch. Arun. Pradh. 52. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 56. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 248-251. 1998; Bose *et al.* Orch. India. 174. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 367. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 124-125. 2005; *et* 100 N.E. Indian Orch. 100-101. 2006; Lucksom, Orch. Sikkim N.E. Himal. 534. t.

544, pl. 22. 2007; Misra, Orch. India. 290. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 456. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1539. 2012. [Plate 4.24. D]

Plant epiphytic herb, 18-33 cm tall. Pseudobulbs 2.8-4.5 × 0.7-1.2 cm, ovoid to ellipsoid-cylindric, sheathed. Leaves 2, 11-18 × 3-3.6 cm, oblong to elliptic, acute, coriaceous, petiolate. Inflorescence subdensely 6 to 14-flowered; peduncle 8-18 cm long, glabrous; rachis 4-7 cm long; pedicellate-ovary 4-7 × 1.6-2 mm, pubescent. Flowers in 2 ranks, sepaline tube 1.3-1.7 cm long, scarlet, hairy externally; floral bracts linear-lanceolate. Sepals 1-1.5 cm long, connate to form a gibbous sepaline tube, free apices triangular, divergent, acute, puberulous externally. Petals 0.8-1 cm, oblanceolate-spathulate, obtuse, long. Lip 0.8-1.1 cm long, simple, oblong, entire, deflexed from a curved base, expanded slightly at apex. Column 3-5 mm long, stout; foot short. Anther dome shaped; pollinia 8.

Flowering : June – July; Fruiting: July – August.
Specimen cited : Dhotrey forest 2300 m, **Rajendra Yonzone, D. Lama and R.B. Bhujel 0872**, dt. 04. 06. 2009.
Status : Threatened.
Local distribution : Birch hill, Senchale, 1600 – 2600 m.
General distribution : India (North East India, Sikkim); Bhutan, Myanmar, Nepal.

Pinalia Lindl.

Plants epiphytic herbs. Pseudobulbs elongated, stem like, many-joined. Leaves flat or terete, thin-textured or coriaceous. Inflorescence terminal or axillary, racemose. Flowers small to medium in size; rachis often hirsute. Sepals free (rarely connate), glabrous or hirsute; lateral pair adnate to the elongate foot of the column to form saccate mentum. Lip sessile on column foot and incumbent. Column short and straight, or long and little curved, broad, often 2-winged, foot prominent. Anther imperfectly 4-loculed; pollinia 8.

The genus *Pinalia* Lindl., comprises about 160 species distributed from North West Himalayas and South East India to Myanmar, South China, Vietnam, Laos, Thailand, the Malay Archipelago, South East Australia, and the Pacific Islands.

Key to the species

1. Pseudobulb cylindric.....2
- 1a. Pseudobulb not cylindric.....4

2. Inflorescence solitary, flowers hairy externally.....*P. stricta*
 2a. Infloresces 2-3, flowers not hairy 3
3. Flower 1-1.4 cm across, white with yellow lip.....*P. graminifolia*
 3a. Flowers 1.2-2 cm across,
 pale yellow with reddish-purple nerves*P. amica*
4. Flower hairy, not fully open;
 pedicellate ovary short (1-1.5 cm).....*P. excavata*
 4a. Flower glabrous, fully open;
 pedicellate ovary long (1.8-2.5 cm)*P. acervata*

Pinalia acervata (Lindl.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

Eria acervata Lindl., J. Hort. Soc. London 6: 57. 1851; Paxt., Fl. Gard. 1: 170. 1852; Hook. f., Fl. Brit. India 5: 796. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 123, t. 170. 1898; Bruhl, Guide Orch. Sikkim. 87. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 359. 1979; Hedge, Orch. Arun. Pradh. 53. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 350. 1998; Bose *et al.* Orch. India. 231. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 379-380. 2002; Lucksom, Orch. Sikkim N.E. Himal. 561. t. 579. 2007; Misra, Orch. India. 296. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541-1542. 2012; *et* Pleione. 6(2): 363. 2012.

Eria poilanei Gagnep., Bull. Mus. Natl. Hist. Nat. ser.2, 2: 310. 1930.

Plant epiphytic herb, 12-25 cm tall. Pseudobulbs 3-6 × 1-2 cm, narrowly ellipsoid, sheathed. Leaves 4-7, 6-17 × 1.6-2.5 cm, narrowly oblanceolate, obtuse-emarginate, petiolate. Inflorescence 2-5, 6-14 cm long, laxly 8 to 12-flowered; peduncle 1-2 cm long, sheathed; rachis 3-4.4 cm long, glabrous; pedicellate-ovary 1.8-2.5 cm long, slender, glabrous. Flowers 1.1-1.3 cm long, glabrous, white; floral bracts lanceolate. Sepals subsimilar; dorsal sepal 1-1.2 × 0.4-0.5 cm, lanceolate, acuminate; lateral pair 1-1.2 × 0.6-0.7 cm, falcate. Petals 0.7-0.9 × 0.2-0.3 cm, narrowly lanceolate. Lip 0.7-0.8 × 0.3-0.6 cm, 3-lobed, tinged with yellow, obovate; side lobes oblong, obtuse; apical lobe ovate, margins entire; disc with 3 narrow, parallel ridges; mentum short. Column 3-4 mm long; foot short. Anther orbicular-quadrangle; pollinia 8.

Flowering	: May – August; Fruiting: July – September.
Specimen cited	: Kalijhora forest 400 m, Rajendra Yonzon, D. Lama and R. B. Bhujel 0608 , dt. 02. 08. 2008.
Status	: Rare.
Local distribution	: Relli, Nokdara, Jholung, Sepkhola, Mungpong, 200 – 900 m.
General distribution	: India (North East India, Sikkim, West Bengal); Bhutan and Nepal.

Pinalia amica (Rchb. f.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

Eria amica Rchb. f., Xenia Orchid. 2: 162, t.168. 1870; Hook. f., Fl. Brit. India 5: 800. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 364. 1979; Deva & Naithani, Orch. N.W. Himal. 269. t. 270. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 350. 1998; Bose *et al.* Orch. India. 232. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 380-381. 2002; Lucksom, Orch. Sikkim N.E. Himal. 561-562. t. 580, pl. 24. 2007; Misra, Orch. India. 297. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1542. 2012; *et* McAllen Int. Orch. Soc. J.13(2): 11-16. 2012; *et* Pleione. 6(2): 363. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 186. 2013.

Eria confusa Hook. f., ic. Pl. t.1850. 1889; Bruhl, Guide Orch. Sikkim. 84. 1926.

E. andersonii Hook. f., Fl. Brit. Ind. 5(2): 795. 1890.

P. andersonii (Hook. f.) Kuntze, *loc. cit.* 1891.

P. confusa (Hook. f.) Kuntze, *loc. cit.* 1891.

Eria hypomelana Hayata, Icon. Pl. Formos. 4: 54, t.22. 1914.

Plant epiphytic herb, 13-26 cm tall. Pseudobulbs 6-15 × 0.8-1.4 cm, erect-cylindric, sheathed. Leaves 2, 11-14.5 × 1.5-2.1 cm, oblong-lanceolate, acute, petiolate. Inflorescence 1-3, laxly 7 to 11-flowered; peduncle 2-2.6 cm long, slender; rachis 5.2-6 cm long, hairy; pedicellate-ovary 0.9-2.1 cm long, slender, hairy. Flowers 1.2-2 cm across, pale-yellow with reddish-purple nerves; floral bracts oblong-lanceolate. Sepals subsimilar, 0.8-1 × 0.4 cm; dorsal sepal 8.5-9 × 3.4-3.8 mm, elliptic, acute; lateral pair 8.5-9 × 5-5.5 mm, lanceolate, oblique, connate at base to form a mentum. Petals 0.8-0.9 cm long, linear-lanceolate, acute. Lip 0.8-0.9 × 0.5-0.8 cm, 3-lobed, yellow with 3 dark-purple lamellae on disc, shortly clawed; side lobes rounded; apical lobe oblong-elliptic, lobes rounded. Column 4-5 mm long, incurved; foot short. Anther ovate; pollinia 8.

Flowering : March – June; Fruiting: May – July.

Specimen cited : Kumsi forest 650 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0786**, dt. 20. 03. 2009.

Status : Sparse.

Local distribution : Panbu, Algarah, Samthar, Pareng, Gasoke, 500–1600 m.

General distribution : India (North East India, Sikkim, West Bengal); Bhutan, Myanmar, Thailand, Vietnam.

Note: Intraspecific floral morphological variation in the population of *Pinalia amica* Rchb. f. [Plate 4.11]

The observations made on the variation in floral morphology and in colour of lamellae on disc of lip. It is clear that the species studied varied distinctly in most of the studied plant characters. The comparison is presented between normal and the plant where variation occurred. The flowers, dorsal sepal, lateral pair, petals and the

lips showed variation within the species in their morphology and colour. The intraspecific floral morphological variation is shown in Table 4.2. and Plate 4.11. where B, B1, B2 and B3 are floral parts taken from plant showing variation have slightly smaller flower size and distinct different color compared to the normal due to presence of light purple coloured longitudinal lamellae on the disc; light yellow colour apical lobe; side lobes light pink, ventral side of mentum base is light pale colour instead of distinct dark colour longitudinal lamellae on the disc; distinct yellow apical lobe, side lobes dark pink and dark coloured ventral side of mentum base of A, A1, A2 and A3 of type species of *Pinalia amica* Rchb. f. After critical observation literature consultation and discussion, its taxonomic identity has been finalized and it has been concluded that the species is same but intraspecific floral morphological as well as colour variation in natural population of the same species. The present study is of the similar nature and an intense field survey to various other parts of Darjeeling Himalaya could not yield any such variation in the nature.

Table 4.2: Comparative morphology of *Pinalia amica* Rchb. f. and intraspecific variation occurred species.

Plant Character	<i>Pinalia amica</i> Rchb. f. type species	<i>Pinalia amica</i> Rchb. f. (where variation occurred)
Plant height	15-26 cm tall.	20 cm tall.
Stem	9-15 × 1-1.5 cm	9-14 × 1.2-1.3 cm
Leaf	2-4, 10-17 × 1.8-2.9 cm.	3, 12-14.5 × 1.5-2.1 cm.
Inflorescence	1-4, 5-10 cm long, 9-13 flowers, peduncle 2.3 cm, rachis 7.7 cm	1, 7 cm long, 11 flowers, peduncle 1.6 cm, rachis 5.4 cm
Flower	1.4-1.6 cm across, dull yellow with reddish-purple nerves. 3 dark color longitudinal lamellae on the middle of the disc and meet at the base of apical lobe. Column 0.3-0.4 × 0.3 cm, white. Anther 1.1-1.2 × 1.2-1.3 mm, ovate, light yellow; pollinia 8, yellow, oval 0.5 × 0.3 mm.	1.1-1.3 cm across, light yellow with reddish-purple nerves. 3 purple lamellae runs on the lamina and meet at the base of apical lobe of lip. Column 0.3 × 0.2 cm. Anther 1.1 × 1.2 mm; pollinia 8, yellow, 0.3 × 0.2 mm.
Dorsal Sepal	1-1.1 × 0.4-0.5 cm, dorsal sepal-lateral pair-1.4 cm across	0.8-1 × 0.4 cm. dorsal sepal-lateral pair -1.3 cm across
Lateral pair (sepals)	0.9-1 × 0.4-0.5 cm, triangular, obtuse, 5-nerved, dorsally.	0.8-0.9 × 0.5-0.6 cm. lateral pair - lateral pair - 1.4 cm across.
Petals	0.9 × 0.3-0.4 cm, Petal to petal-0.8 cm across.	0.8-0.9 × 0.3-0.4 cm. Petal- petal-0.6 cm across.

Lip	0.8-0.9 × 0.4-0.6 cm long, 0.8 when expanded, blackened at claw, lamina distinctly 3-lobed, side lobes 0.5-0.6 × 0.4-0.5 cm, erect, oblong, apex rounded, dark-purple blotch; apical lobe reniform, decurved; disc with 3 dark purple lamellae 0.6-0.7 cm meet at the base of apical lobe. Apical lobe 0.4-0.6 cm; reniform, decurved; mentum short, basal portion of ventral side of mentum is black blotch.	0.5-0.7 × 0.3-0.5 cm, 0.6 cm when expanded, purple at claw, lamina distinctly 3-lobed, side lobes 0.5 × 0.3 cm, erect; and 0.7 cm when spread; oblong, light purple, apical lobe 0.3-0.5 cm; reniform, decurved; disc with 3 purple lamellae 0.6 cm and meet at the base of apical lobe and run at the claw and the middle lamella is shallow. Ventral side of mentum is light pale triangular blotch.
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Colour of a flower is not a major criteria in plant taxonomy however some biologists consider it as a tread and distinguish as new species, variety or forma. Therefore, it has been considered neither as a new species, new variety nor a forma but an intraspecific variation because of environmental effect on the natural population.

Pinalia excavata (Lindl.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

Eria excavata Lindl., Gen. Sp. Orchid. Pl.: 67. 1830; Hook. f., Fl. Brit. India 5: 795. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 124, t. 171. 1898; Bruhl, Guide Orch. Sikkim. 87. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 360. 1979; Banerji, Orch. Nepal. 69. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 363. 1998; Bose *et al.* Orch. India. 236. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 381-382. 2002; Lucksom, Orch. Sikkim N.E. Himal. 562-563. t. 582, pl. 24. 2007; Misra, Orch. India. 297. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1542. 2012; *et* Pleione. 6(2): 364. 2012.

Octomeria excavata Wall., Lindl., Gen. Sp. Orchid. Pl.: 67. 1830.

Eria flava var. *rubida* Lindl., J. Proc. Linn. Soc., Bot. 3: 49. 1859.

E. sphaerochila Lindl., *op. cit.* 54. 1859.

Plant epiphytic herb, 11-23 cm tall. Pseudobulbs 3-6.5 × 1-1.3 cm, cylindrical, compressed, rugose. Leaves 4-6, 5-13 × 1.2-3 cm, elliptic-lanceolate, acute, petiolate. Inflorescence solitary, terminal, erect to decurved, racemes, laxly 7 to 13-flowered; peduncle 3.5-5 cm long, hairy; rachis 4-5 cm long; pedicellate-ovary 1-1.5 cm long, reddish- hairy. Flowers 0.8-1.1 cm across, white suffused with pink, hairy; floral bracts tomentose. Sepals subsimilar, 7-9 × 3.5-4 mm, connivent; dorsal sepal elliptic-lanceolate, acute; lateral pair ovate-lanceolate, subacute, falcate. Petals 7-8 × 2.2-2.4 mm, lanceolate, obtuse. Lip 5.6-7 × 3-4 mm, 3-lobed, white striped with reddish-purple lines, sessile; side lobes rounded; apical lobe decurved, oblong-cordate, apex acute; disc with 2-callose. Column 1.6-2.1 mm long, white. Anther 4-chambered; pollinia 8.

Flowering

: April – June; Fruiting: May – July.

Specimen cited	: Tangta forest 2100 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0233 , dt. 19. 03. 2008.
Status	: Frequent.
Local distribution	: Todey forest, Rambi forest, Sukiapokhari, Charkhol, Chimney, Dhotray, Gumbadara, Pokhraybong, 1100 – 2800 m.
General distribution	: India (Arunachal Pradesh, Meghalaya, Nagaland, North West Himalaya, Sikkim); Bhutan, Cambodia, Laos, Myanmar, Vietnam.

Pinalia graminifolia (Lindl.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

Eria graminifolia Lindl., J. Proc. Linn. Soc., Bot 3: 54. 1859; Hook. f., Fl. Brit. India 5: 794. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 119, t. 164. 1898; Bruhl, Guide Orch. Sikkim. 85. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 363. 1979; Banerji, Orch. Nepal. 70. 1982; Deva & Naithani, Orch. N.W. Himal. 269 – 273. t. 272. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 367. 1998; Bose *et al.* Orch. India. 236. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 382. 2002; Lucksom, Orch. Sikkim N.E. Himal. 563. t. 583. 2007; Misra, Orch. India. 297. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1542. 2012; *et* Pleione. 6(2): 364. 2012.

Plant epiphytic herb, 15-36 cm tall. Pseudobulbs 8-17 × 0.6-1 cm, narrowly cylindrical, sheathed. Leaves 2-6, 9-16 × 2-2.5 cm, clustered at apex of pseudobulb, linear-lanceolate, acuminate, petiolate. Inflorescence 2 or 3, from pseudobulb apex among young leaves, erect, racemes, laxly 9 to 15-flowered; peduncle 1.5-2 cm long; rachis 4-8 cm long; pedicellate-ovary 0.6-0.8 cm long, hairy. Flowers 1-1.4 cm across, white; floral bracts ovate-lanceolate. Sepals subsimilar; dorsal sepal 0.9-1 × 0.3-0.4 cm, lanceolate, acute; lateral pair 0.7-0.8 × 0.4-0.5 cm, slightly falcate. Petals 0.7-0.9 × 0.2-0.23 cm, oblong, subacute, slightly falcate. Lip 0.5-0.7 × 0.4-0.5 cm, 3-lobed, fleshy; side lobes oblong, incurved; apical lobe oblong, emarginated; disc with 3 ridges. Column 2.2 × 0.2 cm, broad; foot stout. Anther ovate; pollinia 8.

Flowering	: May – August; Fruiting: June – September.
Specimen cited	: Toroyok Busty 1700 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1206 , dt. 30. 05. 2010.
Status	: Threatened.
Local distribution	: Sirikhola, Birch Hill, Ramam, Tangta forest, 1800 – 3450 m.
General distribution	: India (North East India, West Bengal); Bhutan, Myanmar, Nepal.

Pinalia stricta (Lindl.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

Eria stricta Lindl., Coll. Bot. 8: t.41b. 1826; Hook. f., Fl. Brit. India 5: 791. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 125, t. 173. 1898; Bruhl, Guide Orch. Sikkim. 85. 1926; Tuyama in Hara, Fl. E. Himal. 2: 186. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 366. 1979; Hedge, Orch. Arun. Pradh. 54. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 381-385. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 378. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 132-133. 2005; Lucksom, Orch. Sikkim N.E. Himal. 555-556. t. 572, pl. 23. 2007; Misra, Orch. India. 298. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1542. 2012; *et Pleione.* 6(2): 364. 2012.

Mycaranthes stricta (Lindl.) Lindl., Gen. Sp. Orchid. Pl.: 63. 1830.

Eria secundiflora Griff., Not. Pl. Asiat. 3: 302. 1851; Icon. Pl. Asiat. 3: t.302. 1851.

Plant epiphytic herb, 16-34 cm tall. Pseudobulbs 8-16 × 0.4-0.7 cm, crowded, cylindric, sheathed. Leaves 2, 6.9-12.5 × 1.3-2.5 cm, arising from pseudobulb apex, oblong-elliptic, acute, petiolate. Inflorescence solitary, 8-17 cm long, exceeding the leaves, racemes, secund, densely many-flowered; peduncle 3-9 cm long, glabrous; rachis 5-11 cm long; pedicellate-ovary 5-8 mm long, densely woolly. Flowers 3-5 mm long, white, hairy externally; floral bracts minute, ovate. Sepals similar, 2-3.1 × 1.5-3 mm, tomentose externally, ovate. Petals 2-3 × 1-1.6 mm, ovate-orbicular, obtuse. Lip 2-2.7 mm long, obscurely 3-lobed, suborbicular, white streaked with yellow, concave; side lobes rounded; apical lobe truncate; disc with depressed callus. Column 1-1.5 mm long, broad; foot short. Anther conical; pollinia 8.

Flowering	: January – April; Fruiting: March – May.
Specimen cited	: Suruk Busty 700 m, Rajendra Yonzon, D. Lama and R. B. Bhujel 0043 , dt. 14. 02. 2007.
Status	: Sparse.
Local distribution	: Samalbong, Chuikhim, Chisang-Godok, Latpanjar, Guling forest, 400 – 1400 m.
General distribution	: India (Sikkim, West Bengal, Meghalaya, Nagaland); Bhutan, Myanmar.

Eria Lindl.

Plants perennial epiphytic or rarely terrestrial herb. Pseudobulbs elongated and stem like, 1 or 3 joined. Leaves flat or terete, coriaceous. Inflorescence terminal or axillary, racemes or rarely solitary-flowered. Flowers small to medium in size; rachis often hirsute or woolly. Sepals free (rarely connate), glabrous or hirsute; lateral pair adnate to the elongate foot of the column to form saccate mentum. Lip 3-lobed or

simple, disc with callus. Column short and straight, often 2-winged, foot prominent. Anther imperfectly 4-loculed; pollinia 8.

The genus *Eria* Lindl., comprises about 370 species, widespread in tropical Asia, extending east to New Guinea, Australia and the Pacific Islands.

Key to the species

1. Pseudobulbs with 1 distinct internode2
 - 1a. Pseudobulbs with several internodes5
2. Lip simple*E. vittata*
 - 2a. Lip 3-lobed.....3
3. Pseudobulbs cylindric, more than 4 cm tall4
 - 3a. Pseudobulbs conical, flask shaped, less than 3.5 cm tall.....*E. clausa*
4. Leaves 2; flowers more than 2 cm long;
 - pseudobulbs 5-16 cm tall.....*E. coronaria*
 - 4a. Leaves 2-6; flowers less than 1.3 cm long;
 - pseudobulbs 4-9 cm tall *E. bractescens*
5. Plant more than 30 cm tall; stem more than 7-leaved.....6
 - 5a. Plant less than 30 cm tall; stem less than 7-leaved.....7
6. Leaves less than 1.5 cm wide, terete to flat;
 - inflorescence many-flowered.....*E. paniculata*
 - 6a. Leaves more than 2 cm wide, narrowly
 - elliptic-oblong; inflorescence few-flowered *E. bambusifolia*
7. Leaves less than 7 mm wide, terete.....*E. pannea*
 - 7a. Leaves more than 7 mm wide, flat.....8
8. Inflorescence globose-capitate,*E. pumila*
 - 8a. Inflorescence racemes.....9
9. Inflorescence glabrous.....10

- 9a. Inflorescence tomentose.....*E. lasiopetala*
10. Inflorescence less than 1 cm long; 3 or 4-flowered.....*E. biflora*
- 10a. Inflorescence more than 2 cm long;
densely many-flowered.....*E. spicata*

Eria bambusifolia Lindl., J. Proc. Linn. Soc., Bot. 3: 61. 1859; Hook. f., Fl. Brit. India 5: 805. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 119, t. 163. 1898; Bruhl, Guide Orch. Sikkim. 85. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 366. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 84. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 350-354. 1998; Bose *et al.* Orch. India. 232. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 379. 2002; Lucksom, Orch. Sikkim N.E. Himal. 564. t. 584, pl. 24. 2007; Misra, Orch. India. 297. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1542. 2012; *et Pleione.* 6(2): 363. 2012; Misra, Orch. Odisha. 272-273. 2014.

Pinalia bambusifolia (Lindl.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

Plant epiphytic herb, 34-65 cm tall. Stem cylindric, sheathed. Leaves 6-11, 9-20 × 2.5-4.8 cm, elliptic-oblong, acuminate, sheathing base. Inflorescence apical, racemes, lax; peduncle 3-4.5 cm long, sheathed, reddish-hairy; rachis 12-16 cm long, hairy; pedicellate-ovary reddish. Flowers 1-2.2 cm across, whitish-purple; floral bracts apiculate. Sepals reddish externally, spreading; dorsal sepal 1-1.3 × 0.4-0.5 cm, elliptic, obtuse; lateral pair 0.9-1.2 × 0.6-0.7 cm, falcate, connate to form a short mentum. Petals 0.9-1.2 × 3-4 mm, elliptic-oblong, obtuse. Lip 0.9-1 × 0.5-0.6 cm, obscurely 3-lobed, lamellae pale green; side lobes small; apical lobe oblong, obtuse, deflexed; disc with 3 hairy lamellae. Column 7-9 mm long, curved; foot straight. Anther dome shaped; pollinia 8.

- Flowering : October – December; Fruiting: November – January.
- Specimen cited : Today forest 1400 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0405**, dt. 20.05. 2008.
- Status : Rare.
- Local distribution : Godok, Tangta, Sukiapokhari, Rambh forest, 1900 – 2800 m.
- General distribution : India (West Bengal, Meghalaya, Mizoram, Nagaland, Orissa); China, Thailand.

Eria biflora Griff., Not. Pl. Asiat. 3: 302. 1851; Hook. f., Fl. Brit. India 5: 800. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 117, t. 160. 1898; Bruhl, Guide Orch. Sikkim. 84. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 357. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 354. 1998; Bose *et al.* Orch. India. 232. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 378-379. 2002; Lucksom, Orch. Sikkim

N.E. Himal. 558-559. t. 576. 2007; Misra, Orch. India. 297. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1542. 2012; *et* Pleione. 6(2): 363. 2012.

Eria choneana Kranz., Bot. Jahrb. Syst. 8: 203. 1886.

Pinalia biflora (Griff.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

Cylindrolobus biflorus (Griff.) Rauschert, Feddes Repert. 94(7-8): 445. 1983. [Plate 4.25. A]

Plant epiphytic herb, 11-23 cm tall. Pseudobulbs 7-13 × 0.6-0.9 cm, clavate, sheathed. Leaves 3-5, 4-8.5 × 1.2-2.1 cm, arising from pseudobulb apex, elliptic, acute, petiolate. Inflorescence racemes, less than 1 cm long, 3 or 4-flowered; peduncle 2-2.3 mm long, glabrous; pedicellate-ovary 5-6 mm long. Flowers 3.5-5.7 mm long, yellow; floral bracts elliptic, recurved. Sepals connivent at base, subsimilar, elliptic, acute. Dorsal sepal 4.8-5.7 × 2-2.1 mm long; lateral pair 4.9-5.7 × 2-2.2 mm long, falcate; mentum triangular. Petals 4.8-5.3 × 1-1.2 mm long, oblong, obtuse. Lip 3.3-3.9 × 1.5-1.6 mm, obscurely 3-lobed; side lobes short to obscure, incurved; apical lobe oblong, obtuse, margins papillose; disc with 2 erect lamellae. Column 1-1.5 mm long, broad at base. Anther orbicular ovate; pollinia 8.

Flowering : September – October; Fruiting: October – December.
Specimen cited : Najoke forest 400 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1517**, dt. 28. 10. 2010.
Status : Threatened.
Local distribution : Sepkhola, 27th Mile Hydro Electric Power Project sides, Majitar, 400 – 900 m.
General distribution : India (North East India, Sikkim, West Bengal); China, Myanmar and Thailand.

Eria bractescens Lindl., Bot. Reg. 27: misc. 18, no. 46. 1841; Hook. f., Fl. Brit. India 5: 796. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 120, t. 166. 1898; Bruhl, Guide Orch. Sikkim. 87. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 363. 1979; Banerji, Orch. Nepal. 68. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 354-357. 1998; Bose *et al.* Orch. India. 234. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 381. 2002; Lucksom, Orch. Sikkim N.E. Himal. 562. t. 581, pl. 24. 2007; Misra, Orch. India. 297. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1542. 2012; *et* Pleione. 6(2): 363. 2012.

E. pulchella Griff., Not. Pl. Asiat. 3: 297. 1851.

E. griffithii Rchb. f., Xenia Orchid. 2: 163. 1870.

Pinalia bractescens (Lindl.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

P. pulchella (Griff.) Kuntze, *loc. cit.* 1891.

Plant epiphytic herb, 14-28 cm tall. Pseudobulbs 4-8 × 1-1.5 cm, cylindrical. Leaves 2-6, 9-14 × 1-2.6 cm, elliptic-oblong, acute, petiolate. Inflorescences 2, arising from

pseudobulb apex, racemes, laxly 7 to 9-flowered; peduncle 2-2.4 cm long; rachis 6-7 cm long; pedicellate-ovary 0.8-1.4 cm long, glabrous. Flowers 0.9-1.2 cm across, whitish-yellow; floral bracts elliptic-ovate, reflexed. Sepals similar, spreading, elliptic, subacute; dorsal sepal 0.7-1 × 0.2-0.3 cm, lateral pair 0.8-1.1 × 0.3-0.4 cm, ovate-lanceolate, falcate, subacute. Petals 6.5-8 × 2-2.7 cm, oblong, obtuse, revolute. Lip 0.6-0.9 × 0.5-0.6 cm, 3-lobed; side lobes erect, large, rounded; apical lobe oblong, deflexed at apex; disc 3-lamellate. Column 2.5 × 2 mm, stout; foot short. Anther 4 chambered; pollinia 8.

Flowering : April – June; Fruiting: May – July.

Specimen cited : Algarah forest 1800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0897**, dt. 20. 06. 2009.

Status : Rare.

Local distribution : Tinchulay, Latpanjar forest, Pareng, Mungpoo, Dow hill, Nimbong, 300 – 1700 m.

General distribution : India (Assam, Nagaland, Sikkim, West Bengal); Cambodia, Laos, Malaysia, Myanmar, Nepal, Thailand, Vietnam.

Eria clausa King & Pantl., J. Asiat. Soc. Bengal 65(2): 121. 1896; *et* Ann. Roy. Bot. Gard. Calcutta 8: 121, t. 167. 1898; Bruhl, Guide Orch. Sikkim. 89. 1926; Tuyama in Hara, Fl. E. Himal. 2: 186. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 361. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 357. 1998; Bose *et al.* Orch. India. 234. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 371-372, t. 373. 2002; Lucksom, Orch. Sikkim N.E. Himal. 555. t. 571, pl. 23. 2007; Misra, Orch. India. 297. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1542. 2012; *et* Pleione. 6(2): 364. 2012.

Eria corneri var. *clausa* (King & Pantl.) A.N. Rao, J. Econ. Taxon. Bot. 20(3): 708. 1996. [Fig. 4.20]

Plant epiphytic, rhizomatous herb, 7-19 cm tall. Pseudobulbs 2.3-3.4 × 0.9-1.7 cm tall, conical, sheathed. Leaves 2, 7-18 × 1.7-2.7 cm, arising from pseudobulb apex, lanceolate, acuminate, petiolate. Inflorescence 1 or 2, shorter than the leaves, arising from pseudobulbs apex, racemes, laxly 5 to 11-flowered; peduncle 1.8-2.3 cm long, sheathed; rachis 3-5 cm, slightly zigzag; rachis 1.5-4 cm long; pedicellate-ovary 0.9-1.1 cm long. Flowers 5-6 mm long, pale white; floral bracts minute. Sepals similar, dorsal sepal 0.6-0.8 × 0.3 cm, oblong, obtuse; lateral pair 0.6-0.7 × 0.5 cm long. Petals 0.7-0.8 × 0.1 cm long, oblong, obtuse, slightly falcate. Lip 0.7-0.8 × 0.3 cm long, 3-lobed; side lobes rounded, oblique; apical lobe entire; disc with 5-7 dark-purple lamellae. Column 2-3 mm long, foot short. Anther 2 chambers; pollinia 8.

Flowering : February – May; Fruiting: April – June.

Specimen cited : Ramam forest 2500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0779**, dt. 09. 03. 2009.

Status : Threatened.
 Local distribution : Neora Valley, Senchale, 1100 – 2600 m.
 General distribution : India (North East India, Sikkim, West Bengal);
 Bhutan, China, Myanmar, Vietnam.

Eria coronaria (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 271. 1864; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 84. 1926; Tuyama in Hara, Fl. E. Himal. 1: 433. 1966; Tuyama in Hara, Fl. E. Himal. 2: 186. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 357. 1979; Banerji, Orch. Nepal. 69. 1982; Hedge, Orch. Arun. Pradh. 53. 1984; Deva & Naithani, Orch. N.W. Himal. 269. t. 271. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 85. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 361. 1998; Bose *et al.* Orch. India. 234. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 372. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 126-127. 2005; Lucksom, Orch. Sikkim N.E. Himal. 554. t. 569, pl. 23. 2007; Misra, Orch. India. 297. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1542. 2012; *et Pleione.* 6(2): 364. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 190. 2013.

Coelogyne coronaria Lindl., Bot. Reg. 27: 83, misc.83, no.178. 1841.

Trichosma suavis Lindl., Bot. Reg. 28: t.21. 1842; Hook. f., Fl. Brit. India 5: 827. 1890.

Eria cylindropoda Griff., Not. Pl. Asiat. 3: 299, 404. 1851; Icon. Pl. Asiat. 3: t.351A. 1851.

Dendrobium crepidatum sensu Griff., op. cit. 319. 1851, *nom. illeg., non* Lindl. 1850.

Eria suavis (Lindl.) Lindl., J. Proc. Linn. Soc., Bot. 3: 52. 1859.

Trichosma coronaria (Lindl.) Kuntze, Revis. Gen. Pl. 2: 681. 1891. [Fig. 4.21]

Plant epiphytic herb, 15-34 cm tall. Pseudobulbs 5-16 × 0.4-0.6 cm, cylindrical, tufted, sheathed. Leaves 2, 8-15 × 2.5-4.4 cm, arising from pseudobulb apex, elliptic to ovate-lanceolate, acute, sessile, grooved. Inflorescence arising from pseudobulbs apex, 3 to 6-flowered; peduncle short; rachis 3-5 cm long; pedicellate-ovary 1.1-1.4 cm long, glabrous. Flowers 2-2.5 cm across, white; floral bracts lanceolate. Sepals spreading, glabrous; dorsal sepal 1.4-1.8 × 0.5-0.7 cm, elliptic-oblong, subacute; lateral pair 1.5-1.8 × 0.7-1 cm, adnate to the column foot to form a mentum. Petals 1.4-1.6 × 0.5-0.7 cm, elliptic-oblong, acute, glabrous. Lip 1.3-1.7 × 1-1.3 cm, 3-lobed, streaked with dark-violate, oblong; side lobes rounded; apical lobe oblong, revolute; disc with 2 undulate ridges. Column 5-7 mm long, stout; foot short. Anther white; pollinia 8.

Flowering : October – December; Fruiting: November – January.

Specimen cited : Today forest 1500 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0175**, dt. 27. 10. 2007.

Status : Frequent.

Local distribution	: Nimbong, Damsang Gari, Nockdara, Lava, Dilaram, Chimney, Tangta, Baggora, Rimbik, 1000 – 2300 m.
General distribution	: India (North East India, North West Himalaya, Sikkim, West Bengal); Bhutan, China, Nepal, Thailand, Vietnam.

Eria lasiopetala (Willd.) Ormerod, Opera Botanica 124: 22. 1995; Pearce & Cribb, Fl. Bhutan, 3(3): 376-377. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 128-129. 2005; *et* 100 N.E. Indian Orch. 104-105. 2006; Lucksom, Orch. Sikkim N.E. Himal. 556-557. t. 573, pl. 24. 2007; Misra, Orch. India. 298. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1542. 2012; *et* Pleione. 6(2): 364. 2012; *et* McAllen Int. Orch. Soc. J. 14(7): 2–7. 2013; Chowdhery & Agrawala, A Century W.H. Orch. 196. 2013; Misra, Orch. Odisha. 276-277. 2014. *Epidendrum flos aeris?* Konig, Retzius, Observ. Bot. 6: 64. 1791.

Aerides lasiopetala Willd., Sp. Pl. ed.4(1): 130. 1805.

Epidendrum lasiopetalum (Willd.) Poiret, Lam., Encycl. suppl. 1(1): 384. 1810.

Dendrobium pubescens Hook., Exot. Fl. 2: t.124. 1825.

D. albidotomentosum Bl., Bijdr.: 345. 1825.

Octomeria pubescens (Hook.) Spreng., Syst. Veg. ed.16(4): 310. 1827.

O. flava Wall. *ex* Lindl., Gen. Sp. Orchid. Pl.: 65. 1830.

Eria flava Lindl., Gen. Sp. Orchid. 65. 1830; Hook. f., Fl. Brit. India 5: 801. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 126, t. 175. 1898; Bruhl, Guide Orch. Sikkim. 88. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 354. 1979; Banerji, Orch. Nepal. 69. 1982; Hedge, Orch. Arun. Pradh. 53. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 373. 1998.

E. albidotomentosa (Bl.) Lindl., *op. cit.* 66. 1830.

E. pubescens (Hook.) Lindl. *ex* Loudon, Hort. Brit.: 372. 1830; Bose *et al.* Orch. India. 240. 1999.

E. pubescens (Hook.) Lindl. *ex* Steud., Nomencl. Bot. 2(1): 566. 1840.

Pinalia albidotomentosa (Bl.) Kuntze, Revis. Gen. Pl. 2: 678. 1891.

P. pubescens (Hook.) Kuntze, *loc. cit.* 1891.

Plant epiphytic, rhizomatous herb, 19-37 cm tall. Pseudobulbs 3.5-5 × 2.3-3.5 cm, ellipsoid, furrowed, sheathed. Leaves 3-5, 7-16 × 2-3.4 cm, oblong, acuminate, petiolate. Inflorescence lateral, tomentose, racemes, subdensely 6 to 14-flowered; peduncle 3-6 cm long, softly white-tomentose, sheathed at base; rachis 7-13 cm long, white-tomentose; pedicellate-ovary 1.6-2.6 cm long, tomentose. Flowers 1.8-2.3 cm across, greenish-yellow, white tomentose externally; floral bracts lanceolate. Sepals subsimilar; dorsal sepal 1-1.3 × 0.4-0.5 cm, lanceolate; lateral pair 1.3-1.7 × 0.6-0.9 cm, lanceolate, triangular, acute, tomentose at apex. Petals 0.7-0.9 × 0.2-0.3 cm, ovate-oblong, parallel to column. Lip 1-1.3 × 0.5-0.6 cm, 3-lobed, yellow with brownish purple; side lobes truncate; apical lobe oblong, acute, recurved; disc with 2 calluses. Column 4-5 mm long, foot short. Anther orbicular; pollinia 8.

Flowering	: February – May; Fruiting: April – June.
Specimen cited	: Kalijhora forest 450 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0227 , dt. 19. 03. 2008.
Status	: Common.
Local distribution	: Relli, Sevoke, Bagrakote, Seokbir khani, Jholung, Chitrey-Teesta, Lohapul, Solok-Kalimpong, 200 – 700 m.
General distribution	: India (North East India, Sikkim, West Bengal); Bhutan; Cambodia, China, Laos, Myanmar, Nepal, Thailand, Vietnam.

Note: Intraspecific lip colour variation observed on the flowers of *Eria lasiopetala* (Willd.) Ormerod. [Plate 4.12]

Morphologically both specimens perfectly look alike. Floral measurements of both the specimens are also same but distinct variation observed on the lip colour of the flowers. The specimen A, A1 and A2 of flowers with pure yellowish lip colour but in the specimen B, B1 and B2 of flowers showing purple red colour on the lip of the flowers. Both specimen A and B is not found within same population on the same host tree. It seems that this is the first time that such observation has been made with comparative colour photograph. In plant taxonomy where colour variation is not species identification criteria if it not differs with distinguish morphological characters.

After through verification and consult with plant taxonomists and orchidologists of the regions, it was concluded that occur variation is not a great criteria and it can not be categorized in new species, sub species, variety or forma but it is an intraspecific lip colour variation in the flowers of *Eria lasiopetala* (Willd.) Ormerod. In this case, it was concluded that it may be due to environmental effects on the plant species.

Eria paniculata Lindl., Wall., Pl. Asiat. Rar. 1: 32, t.36. 1830; Hook. f., Fl. Brit. India 5: 789. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 126, t. 174. 1898; Bruhl, Guide Orch. Sikkim. 82. 1926; Tuyama in Hara, Fl. E. Himal. 2: 186. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 356. 1979; Banerji, Orch. Nepal. 70. 1982; Hedge, Orch. Arun. Pradh. 53. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 373. 1998; Bose *et al.* Orch. India. 238. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 377-378. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 130-131. 2005; Lucksom, Orch. Sikkim N.E. Himal. 558. t. 575, pl. 24. 2007; Misra, Orch. India. 298. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1542. 2012; *et* Pleione. 6(2): 364. 2012.

Dendrobium floribundum D. Don, Prodr. Fl. Nepal.: 34. 1825.

Pinalia panuculata (Lindl.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

Plant epiphytic herb, 31-45 cm tall. Stems pendent, woody, sheathed. Leaves many, 10-24 × 0.9-1.4 cm, linear, acuminate, petiolate. Inflorescences 2-4, terminal, fasciculate to paniculate, densely many-flowered; peduncle 3-7 cm long, woody-hairy; rachis 6-17 cm long; pedicellate-ovary 5-8 mm long, hairy. Flowers 0.7-1.1 cm across, pale-green with reddish purple spots; floral bracts lanceolate. Sepals subequal, 3-nerved; dorsal sepal 3.6-5 × 2.2-2.8 mm, ovate, sub-acute; lateral pair 3.9-5.4 × 2.5-3.7 mm, triangular, slightly falcate, spreading; dorsal sepal ovate. Petals 3-4.5 × 1.5-2.3 mm, elliptic-obovate, margins slightly erose. Lip 3-4.5 × 3-4.5 mm, 3-lobed; side lobes oblong, slightly falcate, subacute, porrect; apical lobe suborbicular, margins erose; disc 2-calli. Column 2-2.6 mm long, stout; foot narrow. Anther cordate; polinia 8.

Flowering : January – May; Fruiting: April – June.
 Specimen cited : Alarah forest 1900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0342**, dt. 26. 04. 2008.
 Status : Rare.
 Local distribution : Lungshel, Relli, Todey, Pedong, Charkhol,
 600 – 1100 m
 General distribution : India (North East India, Sikkim, West Bengal);
 Bhutan, Cambodia, Laos, Myanmar, Nepal,
 Thailand, Vietnam.

Eria pannea Lindl., Bot. Reg. 28: misc.64, no.79. 1842; Hook. f., Fl. Brit. India 5: 804. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 127, t. 176. 1898; Bruhl, Guide Orch. Sikkim. 83. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 356. 1979; Hedge, Orch. Arun. Pradh. 54. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 373. 1998; Bose *et al.* Orch. India. 240. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 374. 2002; Lucksom, Orch. Sikkim N.E. Himal. 557. t. 574, pl. 24. 2007; Misra, Orch. India. 298. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1542. 2012; *et Pleione.* 6(2): 364. 2012.

Eria teretifolia Griff., Itin. Pl. Khasyah Mts.: 202. 1848.

E. calamifolia Hook. f., Fl. Brit. India 6(1): 191. 1890.

Panalia calamifolia (Hook. f.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

P. pannea (Lindl.) Kuntze, *loc. cit.* 1891.

Plant epiphytic, rhizomatous herb, 8-22 cm tall. Leaves 2-6, 6-19 × 0.4-0.6 cm, fleshy, subterete. Inflorescence solitary to 4-flowered; peduncle 1-2 cm long, woolly; rachis 2-3 cm long, densely woolly; pedicellate-ovary 0.4-0.5 cm long, hairy. Flowers 1-1.3 cm wide, orange-brown; floral bracts ovate. Sepals similar, elliptic to ovate, acute, densely white-woolly externally; dorsal sepal 5-8 × 2-4 mm; lateral pair 8-10 × 6-7 mm, slightly falcate; mentum curved, obtuse. Petals 4-5 × 2.8-3.1 mm, elliptic. Lip 7-8 × 3-3.3 mm, simple, dark reddish-purple, fleshy, oblong,

obtuse, margins slightly undulate; basal callus oblong-granular. Column 1-2 mm long, hairy externally; foot curved. Anther ovate-oblong; pollinia 8.

Flowering : May – July; Fruiting: June – August.
Specimen cited : Kambal Busty 600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1592**, dt. 10. 05. 2011.
Status : Rare.
Local distribution : Kumsi forest, Chisang-Godok, 600 – 1000 m.
General distribution : India (North East India, Sikkim, West Bengal);
Bhutan, Borneo, China, Malaysia, Myanmar,
South East Asia and Sumatra.

Eria pumila Lindl., Gen. Sp. Orchid. Pl.: 68. 1830; Hook. f., Fl. Brit. India 5: 791. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 118, t. 162. 1898; Bruhl, Guide Orch. Sikkim. 81. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 361-362. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 377. 1998; Bose *et al.* Orch. India. 240. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 383. 2002; Lucksom, Orch. Sikkim N.E. Himal. 559. t. 577. 2007; Misra, Orch. India. 298. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1542. 2012; *et* Pleione. 6(2): 364. 2012.

Pinalia pumila (Lindl.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

Plant epiphytic, 13-26 cm tall. Pseudobulbs 4-6 cm long, subcylindric to clavate, crowded, sheathed. Leaves 3-5, 4.4-10.6 × 1-2 cm, linear-lanceolate, acute, sheathing petiole. Inflorescence short, globose-capitate, densely many-flowered; peduncles 2-4 mm long, axillary, hairy; pedicellate-ovary tomentose. Flowers 3.9-4.2 mm across, white suffused with purple; floral bracts minute, oblong. Sepals similar, 2-3 × 1.2-1.6 mm, oblong, obtuse. Petals 2-3 × 0.6-0.8 mm long, oblong, obtuse, spreading. Lip 2-3 × 1.8-2.2 mm, 3-lobed, oblong; side lobes dentate, acute, erect; apical lobe 2-lobed at tip; disc with 2 basal calli. Column 2 mm long, hairy; foot short. Anther white; pollinia 8.

Flowering : May – August; Fruiting: June – September.
Specimen cited : Kalijhora forest 500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1307**, dt. 07. 07. 2010.
Status : Rare.
Local distribution : Sevoke, Jaldhaka, Sepkhola, Mungpong,
200 – 600 m.
General distribution : India (North East India, Sikkim, West Bengal);
Bhutan, Myanmar.

Eria spicata (D. Don) Hand.-Mazz., Symb. Sin. 7: 1353. 1936; Pradhan, Indian Orch. Guide Identif. Cult. 2: 364-365. 1979; Hedge, Orch. Arun. Pradh. 54. 1984; Deva & Naithani, Orch. N.W. Himal. 277 – 280 t. 279. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 381. 1998; Bose *et al.* Orch. India. 242. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 383-384. 2002; Lucksom, Orch. Sikkim N.E. Himal. 559-560. t. 578, pl. 24. 2007; Misra, Orch. India. 298. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1542. 2012; *et* Pleione. 6(2): 364. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 202. 2013.

Octomeria spicata D. Don, Prodr. Fl. Nepal.: 31. 1825.

Pinalia alba Buch.-Ham. *ex* D. Don, Prodr. Fl. Nepal.: 31. 1825.

Eria convallarioides Lindl., Wall. Cat.: 1975. 1829; Gen. Sp. Orchid. Pl.: 70. 1830; Hook. f., Fl. Brit. India 5: 791. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 118, t. 161. 1898; Bruhl, Guide Orch. Sikkim. 86. 1926.

Octomeria convallarioides Wall., Lindl., *loc. cit.* 1830.

Eria convallarioides var. *major* Lindl., Bot. Reg. 33: t.63. 1847.

E. salwinensis Handel – Mazzetti, Symb. Sin. 7: 1352. 1936.

Plant epiphytic herb, 18-28 cm tall. Pseudobulbs 5-16 × 1-2.8 cm, cylindrical, sheathed. Leaves 4-6, 5-19 × 2-4.4 cm, elliptic-lanceolate, acute, petiolate. Inflorescence 2-3, axillary, decurved, densely many-flowered; peduncle 3-5 cm long, glabrous; rachis 3.5-8 cm long; pedicellate-ovary puberulent. Flowers 0.7-0.8 cm across, subglobose, glabrous, white or pinkish-white; floral bracts ovate-lanceolate. Sepals subsimilar, ovate, obtuse; dorsal sepal 3.9-6 × 2-3 mm; lateral pair 3.8-6 × 4-5 mm, concave. Petals 3.5-5 × 1.8-2 mm, oblanceolate, spreading. Lip 3.3-4.5 mm long, 3-lobed, wedge-shaped, concave, tip subacute. Column 2-3.5 mm long, slender; foot curved. Anther dark purple; pollinia 8.

Flowering : February – August; Fruiting: April – September.

Specimen cited : Lungshel Busty 1700 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0601**, dt. 01. 08. 2008.

Status : Frequent.

Local distribution : Nokdara, Kurseong, Kumsi, Rambhi forest, Todey, 300 – 2300 m.

General distribution : India (North India, West Bengal); Bhutan, China, Myanmar, Nepal and Thailand.

Eria vittata Lindl., J. Proc. Linn. Soc., Bot. 3: 51. 1859; Hook. f., Fl. Brit. India 5: 794. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 120, t. 165. 1898; Bruhl, Guide Orch. Sikkim. 88. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 365. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 385. 1998; Bose *et al.* Orch. India. 242. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 374. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 134-135. 2005; Lucksom, Orch. Sikkim N.E. Himal. 554-555. t. 570, pl. 23. 2007; Misra, Orch. India. 298. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci.,

1(4): 460. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1542. 2012; *et* Pleione. 6(2): 364. 2012.

Pinalia vittata (Lindl.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

Plant epiphytic herb, 10-24 cm tall. Pseudobulbs 3.2-6 × 0.8-1.3 cm, ovoid-cylindric, sheathed. Leaves 2, 6-14 × 2-3.8 cm, elliptic-lanceolate, acuminate, petiolate. Inflorescence 6-11 cm long, racemes, arching, densely 6 to 13-flowered; peduncle glabrous; rachis 5-9 cm long; pedicellate-ovary 0.7-0.9 cm long. Flowers 1.8-2.4 cm across, pale-green with brownish-purple strips; floral bracts minute. Dorsal sepal 0.8-1.2 × 0.5-0.6 cm, oblong, subacute; lateral pair 0.8-1.1 × 0.8-1 cm, triangular-oblong, connate at base to form a mentum. Petals 7-1 × 0.3-0.4 cm, narrowly oblong, slightly falcate, obtuse. Lip 1.2-1.4 × 0.5-0.7 cm, simple, oblong, decurved, margins crenulate towards apex, attached to base of column foot, disc with 5 lamellae. Column 0.5-0.7 cm long, curved; foot purple. Anther ovate; pollinia 8.

Flowering	: February – April; Fruiting: March – June.
Specimen cited	: Tangta forest 2300 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1053 , dt. 23. 02. 2010.
Status	: Rare.
Local distribution	: Todey, Neora Valley, Senchale, Tiger Hill, 1500 – 2600 m.
General distribution	: India (Sikkim, West Bengal, Assam, Manipur, Nagaland); Myanmar.

Porpax Lindl.

Plants epiphytic herb, clump-forming. Pseudobulbs crowded, flattened, sheathed. Leaves 1-3, often appearing after the flowers, oblong-elliptic, margins sometimes ciliolate. Inflorescence arising from base or tip of pseudobulb, solitary or 2-flowered; peduncle short; floral bracts conspicuous. Flowers orange-red to deep dull red. Dorsal sepal connate with lateral pair to form a sepaline tube. Petals narrow. Lip minute, obscurely 3-lobed; disc with basal callus. Column minute; pollinia 8.

The genus *Porpax* Lindl., comprises 11 species distributed in India through Thailand and Indo-China to Malaysia and Borneo.

Porpax elwesii (Rchb. f.) Rolfe, Orchid Rev. 16: 8. 1908; Chowdhery, Orch. Fl. Arun. Pradh. 624. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 386 & 388, t. 387. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 136-137. 2005; Lucksom, Orch. Sikkim N.E. Himal. 535. t. 545, pl. 22. 2007; Misra, Orch. India. 315. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1548. 2012.

Eria meirax sensu N.E. Brown, Gard. Chron. n.s. 14: 603. 1880, *non* (Par. & Rchb. f.) N.E. Brown; Fl. Brit. India 5: 786. 1890.

E. elwesii Rchb. f., *op. cit.* 19: 402. 1883.

Porpax meirax sensu King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 114, t.158. 1898, *non* (Rchb. f.) King & Pantl.; Bruhl, Guide Orch. Sikkim. 81. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 370. 1979; Bose *et al.* Orch. India. 415. 1999.

Plant epiphytic herb, 2-2.4 cm tall. Pseudobulbs 0.5-0.8 cm across, globose, depressed, densely clustered, sheathed. Leaves 2, 1.7-3 × 0.3-0.7 cm, appearing after flowering, oblong-lanceolate, mucronate, petiolate. Inflorescence arising from pseudobulbs apex, 1-3-flowered; peduncle short; pedicellate-ovary 2-2.2 mm long. Flower 1-1.2 cm across, solitary, purple-brown; floral bract minute. Sepals united to form sepaline tube. Petals 4-4.5 × 1.5-2 mm, oblong, obtuse. Lip 3.5-4 × 2.3-2.8 mm, obscurely 3-lobed; side lobes rounded; apical lobe ovate-orbicular, entire, tapering to a blunt apex. Column 0.8-1 mm long; foot slightly curved. Anther dome shaped; pollinia 8.

Flowering	: September – November; Fruiting: November – December.
Specimen cited	: Suruk Busty 700 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1519 , dt. 27. 11. 2010.
Status	: Rare.
Local distribution	: Latpanjar, Nimbong, Pudung, Sittong, Toonang, 500 – 1400 m.
General distribution	: India (Sikkim, West Bengal); Malaysia, Nepal, Thailand, Vietnam.

Trichotosia Bl.

Plants perennial epiphytic herbs. Stems long or short, leafy except at base, usually covered with reddish-brown or white hairs. Inflorescences lateral, short, few-flowered or long, pendent and many-flowered; floral bracts hairy, large, concave, spreading at right-angles to rachis. Flowers small to medium in size, resupinate. Sepals red-hairy externally; lateral pair adnate to column foot to form a mentum. Lip entire to obscurely 3-lobed; disc with or without keels, sometimes papillose. Column with a foot; pollinia 8.

The genus *Trichotosia* Bl., comprises about 50 species distributed from Mainland Asia, through South East Asia to New Guinea and the South West Pacific Islands.

Key to the species

1. Stems creeping, less than 4 cm long;
inflorescence solitary-flowered..... *T. dasyphylla*
- 1a. Stems pendent, more than 20 cm long;
inflorescence 3 to 7-flowered..... *T. pulvinata*

Trichotosia dasyphylla (Par. & Rchb. f.) Kranz., Engler, Pflanzenr. (IV.50) Dendrob.: 138. 1911; Chowdhery, Orch. Fl. Arun. Pradh. 671-672. 1998; Bose *et al.* Orch. India. 451. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 390, t. 389. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 140-141. 2005; *et* 100 N.E. Indian Orch. 108-109. 2006; Lucksom, Orch. Sikkim N.E. Himal. 585. t. 594, pl. 24. 2007; Misra, Orch. India. 318. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1549. 2012.

Eria dasyphylla Par. & Rchb. f., Trans. Linn. Soc. London 30: 147. 1874; Hook. f., Fl. Brit. India 5: 808. 1890; Bruhl, Guide Orch. Sikkim. 83. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 347. 1979.

Pinalia dasyphylla (Par. & Rchb. f.) Kuntze, Revis. Gen. Pl. 2: 679. 1891. [Plate 4.25. B]

Plant epiphytic herb, 2.5-3 cm tall. Stems creeping, branched. Leaves 2, 1.2-2.5 × 0.4-0.8 cm, elliptic-ovate, obtuse, fleshy, sessile, hairy. Inflorescence solitary flowered; peduncle short, hairy; pedicellate-ovary hispid. Flowers 0.6-0.9 cm long, pale-green suffused with yellow; floral bract minute. Sepals subsimilar, hairy externally; dorsal sepal 3.6-4.2 × 0.2-0.3 mm long, small, elliptic, erect; lateral pair 5-6 × 4-5 mm, broadly triangular, concave; mentum rounded. Petals 3.5-3.7 × 1.4-1.6 mm, oblong, obtuse. Lip 4-5.4 × 2.7-3.5 mm, slightly 3-lobed, brownish-purple patch at base, wedge-shaped to oblong, ciliolate, base narrowed; side lobes very shallow; apical lobe deflexed, apex broad, emarginated, margins slightly erose. Column 1.2-1.5 mm long; foot long, curved. Anther conical; pollinia 8.

Flowering : April – June; Fruiting: May – July.

Specimen cited : Samalbung Busty 900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0883**, dt. 09. 06. 2009.

Status : Rare.

Local distribution : Nimbong, Suruk, Sittong, Kumsi, Mungpoo, Paiyung, 800 – 1200 m.

General distribution : India (North East India, Sikkim, West Bengal); China, Laos, Myanmar, Nepal, Thailand, Vietnam.

Trichotosia pulvinata (Lindl.) Kranz., Engler & Prantl. Pflanzenr. (IV.50) Dendrob.: 138. 1911; King & Pantl., Orch. Sikkim Himal. 89. 1898; Chowdhery, Orch. Fl. Arun. Pradh. 672. 1998; Bose *et al.* Orch. India. 452. 1999; Pearce & Cribb, Fl.

Bhutan, 3(3): 390-391. 2002; Lucksom, Orch. Sikkim N.E. Himal. 585-586. t. 595, pl. 25. 2007; Misra, Orch. India. 318. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1549. 2012.

Eria pulvinata Lindl., J. Proc. Linn. Soc., Bot. 3: 56. 1859; Hook. f., Fl. Brit. India 5: 807. 1890.

E. rufinula Rchb. f., Hamburger Garten – Blumenzeitung 19: 13. 1863; Hook. f., Fl. Brit. India 5: 807. 1890; Bruhl, Guide Orch. Sikkim. 82. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 348. 1979.

Pinalia pulvinata (Lindl.) Kuntze, Revis. Gen. Pl. 2: 679. 1891.

P. rufinula (Rchb. f.) Kuntze, loc. cit. 1891.

Trichotosia rufinula (Rchb. f.) Kranz., op. cit. 143. 1911. [Fig. 4.22]

Plant epiphytic herb, 17-47 cm tall. Stems pendent, cylindrical, hispid. Leaves many, 7-11 × 1.1-1.9 cm, narrowly lanceolate, acute, sessile. Inflorescence leaf opposed, 3 to 7-flowered; peduncle sheathed at base; rachis 0.9-1.4 cm long, hispid; pedicellate-ovary 0.4 cm long. Flowers 1-1.4 cm long, white flushed with purple; floral bracts hispid. Sepals subequal, 0.8-1 × 0.3-0.4 cm, ovate-lanceolate, subaquate, hispid externally; lateral pair 1-1.2 × 0.4-0.5 cm slightly falcate, forming a mentum. Petals 0.7-0.9 × 0.3 cm, narrowly lanceolate, obtuse, spreading. Lip 1-1.3 × 0.4-0.5 cm, spatulate, margins reflexed; disc with an elongate pulvinate callus. Column 0.5-0.6 cm long; foot curved. Anther dark purple; pollinia 8.

Flowering : June – August; Fruiting: July – September.

Specimen cited : Guling forest 700 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1361**, dt. 25. 07. 2010.

Status : Rare.

Local distribution : Majitar, Suruk, Chibo Busty Gasoke, 400 – 800 m.

General distribution : India (North East India, Sikkim, West Bengal);
China, Malaysia, Myanmar, South East Asia.

Tylostylis Bl.

Plant perennial epiphytic herb. Pseudobulb fleshy, furrowed, constricted. Leaves 3-5, coriaceous, sessile. Flowers small, in extra-axillary or axillary, racemes. Sepals oblong-elliptic, pubescent, spreading. Petals smaller than the sepals. Lip not lobed, mobile, broad, much deflexed, pubescent. Column very long, much curved forwards and downwards, so that its apex is brought opposite the middle of the lip, bearing a large callus at it, base and on the very short foot. Pollinia 8.

The genus *Tylostylis* Bl., comprises about five or six species distributed to China, Himalayan region, India, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam.

Tylostylis discolor (Lindl.) Hook. f., Ann. Roy. Bot. Gard. (Calcutta) 5: 22. 1895; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 89. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 344. 1979; Hedge, Orch. Arun. Pradh. 55. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 677-679. 1998; Bose *et al.* Orch. India. 454. 1999; Lucksom, Orch. Sikkim N.E. Himal. 538. t. 549, pl. 23. 2007.

Callostylis rigida Bl., Bijdr.: 341, t.74. 1825.

Liparis bidentata Griff., Not. Pl. Asiat. 3: 277. 1851; Icon. Pl. Asiat. 3: t.286, f.2. 1851.

Callostylis rigida subsp. *discolor* (Lindl.) Brieger, Schltr., Orchideen ed. 3, 1(11-12): 749. 1981.

Eria discolor Lindl., J. Proc. Linn. Soc., Bot. 3: 51. 1859; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1542. 2012.

Eria pulchella sensu Hook. f., Fl. Brit. India 5: 80. 1890, p.p., non Lindl., 1841. [Fig. 4.23]

Plant epiphytic, rhizomatous herb, 26-38 cm tall. Pseudobulbs 10-22 × 2.4-3.6 cm, thick, cylindrical, furrowed. Leaves 3-6, 10-19 × 2.5-4 cm, narrowly oblong-elliptic, tip emarginate, sessile. Inflorescence arising from pseudobulb apex, few-flowered; peduncle 3-7 cm long, sheathed, hairy; rachis 4-8 cm long, tomentose; pedicellate-ovary tomentose. Flowers 1.2-1.6 cm across, greenish-yellow suffused with brown, tomentose externally; floral bracts shorter than ovary. Sepals similar, oblong-elliptic, obtuse, spreading, fleshy, tomentose externally; dorsal sepal 0.8-1 × 0.4-0.5 cm; lateral pair 0.8-1 × 0.4-0.5 cm, elliptic-oblong. Petals 0.8-0.9 × 0.3 cm, narrowly obovate, obtuse. Lip 4-4.5 × 4.6-4.8 mm, simple, mobile, cordate, apiculate, clawed at base, jointed at base to column foot. Column long, curved; foot short. Anther depressed; pollinia 8.

Flowering : February – May; Fruiting: March – June.

Specimen cited : Relli forest below Kumsi 600 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0513**, dt. 21. 06. 2008.

Status : Sparse.

Local distribution : Sevoke, Kalijhora, Kumsi, Nimbong, Mungpoo, Solok, Samthar, Samsing, Relli-Pala, Pareng, 300 – 1700 m.

General distribution : India (North East India, Sikkim, West Bengal); Laos, Malaysia, Sumatra and Vietnam.

Subtribe **Podochilinae** Benth. & Hook. f.

Appendicula Bl.

Plants epiphytic rarely lithophytic herb. Stems erect or pendent, simple or branched. Leaves distichous, flat, twisted at base so that the blades lie in one plane. Inflorescence terminal, lateral, racemes. Flowers small, (3.5-8 mm long) resupinate. Lateral pair connate at the base and adnate to the long foot of the column to form a mentum. Petals linear, elliptic-oblong. Lip erect, with a round or concave basal appendage, sometimes keeled; apical lobe often with a median keel or callus. Column with a foot; pollinia 8.

The genus *Appendicula* Bl., comprises about 60 species distributed from tropical Asia to the South-West Pacific Islands.

Appendicula cornuta Bl., Bijdr. 1: 302. 1825; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 442. 1979; Bose *et al.* Orch. India. 97. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 391-393, t. 392. 2002; Lucksom, Orch. Sikkim N.E. Himal. 587-588. t. 598. 2007; Misra, Orch. India. 281. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 452. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1536. 2012.

Dendrobium bifarium Lindl., Gen. Sp. Orchid. Pl.: 81. 1830.

Appendicula bifaria (Wall. *ex* Lindl.) Lindl., Hooker's J. Bot. Kew Gard. Misc. 7: 35. 1855; Bruhl, Guide Orch. Sikkim. 146. 1926.

A. bifaria var. *wallichiana* Hook. f., Fl. Brit. India 6(1): 83. 1890.

Podochilus cornutus (Bl.) Schltr., Mem. Herb. Boissier 8(21): 34. 1900.

Plant epiphytic herb, 18-38 cm tall. Stems tufted, slender, covered by leaves. Leaves many, 2.2-3.2 × 0.7-1 cm, oblong-lanceolate, subacute, emarginated, base sheathing. Inflorescence laxly 5 to 7-flowered or subdensely many-flowered; peduncle 6-9 mm long; rachis 5-7 mm long; pedicellate-ovary 1.8-2 mm long, hispid. Flowers 3.5-8 mm long, white suffused with yellow; floral bracts lanceolate. Sepals sub similar, oblong, obtuse, glabrous or externally hairy; dorsal sepal 3-3.7 × 1.2-2.7 mm; lateral pair 4.8-5.3 × 3-3.4 mm, partly joined, apices spreading; mentum short. Petals 2.4-2.9 × 2.3-2.8 mm, obovate-oblong. Lip 3.1-3.6 × 2-2.2 mm, ovate, deflexed, fleshy, obtuse, with a concave, horse shoe-shaped basal appendage; callus broad, cylindrical. Column 1.1-1.7 mm long, long-pointed stielidia on either side of the rostellum. Anther cordate; pollinia 8.

Flowering : August – September; Fruiting: September – October.

Specimen cited : Birik forest 420 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1448**, dt. 30. 08. 2010.

Status : Rare.

- Local distribution : Kambal, 27th Mile Teesta, Hydro Electric Power Project sides, Kumai, Kalijhora, Sepkhola, Leshkhola, 300 – 800 m.
- General distribution : India (North East India, Sikkim, West Bengal), Cambodia, China, East Indonesia, East Malaysia, Myanmar, Phillipines, Thailand, Vietnam.

Podochilus Bl.

Plants small epiphytic or lithophytic herbs. Stems slender, tufted. Leaves numerous, uniform, distichously, lying in one plane. Inflorescence terminal, racemes, few to many flowered. Flowers minute or small (3-6 mm long), resupinate. Sepals and petals similar, adnate at base or free; lateral pair adnate to the column foot forming a spur like mentum; petals smaller than the sepals. Lip narrow, entire to obscurely 3-lobed; disc with a simple or 2-lobed appendage. Column short; rostellum terminal, bifid. foot long, curved. Anther dorsal; pollinia 4.

The genus *Podochilus* Bl., comprises about 60 species distributed from India, Sri Lanka and China South to Indonesia, New Guinea and the South-West Pacific Islands.

Key to the species

1. Leaves equitant, overlapping at base, subfalcate;
flowers white, pinkish tinged; lip bifid at tip*P. cultratus*
- 1a. Leaves not equitant, not overlapping,
linear; flowers white, yellowish
tinged; lip acute at tip *P. khasianus*

Podochilus cultratus Lindl., Gen. Sp. Orchid. Pl.: 234. 1833; Hook. f., Fl. Brit. India 6: 80. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 245, t. 326. 1898; Bruhl, Guide Orch. Sikkim. 145. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 441. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 616. 1998; Bose *et al.* Orch. India. 407. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 393-395. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 142-143. 2005; Lucksom, Orch. Sikkim N.E. Himal. 586. t. 596. 2007; Misra, Orch. India. 314. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1548. 2012.

Plant epiphytic herb, 7-15 cm tall. Stems glabrous. Leaves many, 0.8-1.2 × 0.5-0.9 cm, equitant, lanceolate, falcate, acute. Inflorescence slender, 2 to 4-flowered; rachis

1.1-1.2 cm long; pedicellate-ovary 1.2-1.5 mm long, glabrous. Flowers 4-5 mm across, white; floral bracts ovate-lanceolate. Sepals glabrous white; dorsal sepal 2.7-3 × 1.4-1.6 mm, ovate, acute, hooded over column; lateral pair 3.5-4.4 × 1.5-1.7 mm, ovate, acute to subacute. Petals 2.3-2.5 × 1.1-1.6 mm long, rhombic to obovate, obtuse to subacute. Lip 4.6-5 × 2.4-3 mm, oblong, apex 2-lobed, lobules rounded, deflexed, attached to base of the column foot; disc smooth. Column 2-2.4 mm long. Anther beaked; pollinia 4.

Flowering : August – September; Fruiting: September – October.
Specimen cited : Dudhay 600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1442**, dt. 20. 08. 2010.
Status : Rare.
Local distribution : Panbu, Seokbir khani, Solok, Yangmakum, 300–1700 m.
General distribution : India (North East India, Sikkim); Bhutan, China, Myanmar, Nepal, Thailand.

Podochilus khasianus Hook. f., Fl. Brit. India 6(1): 81. 1890; Icon. Pl. 22: t.2146. 1894; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 246, t. 327. 1898; Hedge & A.N. Rao, J. Econ. Taxon. Bot. 4(2): 388. 1983; Bruhl, Guide Orch. Sikkim. 145. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 441. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 74. 1998; Bose *et al.* Orch. India. 407. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 395, t. 394. 2002; Lucksom, Orch. Sikkim N.E. Himal. 587. t. 597. 2007; Misra, Orch. India. 314. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1548. 2012.

Podochilus chinensis Schltr., Feddes Repert. Spec. Nov. Regni Veg. 19: 380. 1924.

Plant epiphytic herb, 9-15 cm tall. Stems slender, sheathed. Leaves many, 0.8-1.3 × 0.0.2-0.3 cm, linear-oblong, acute, coriaceous, jointed. Inflorescence 3 to 5-flowered; rachis 0.4-0.6 cm long, glabrous, slightly zigzag; pedicellate-ovary 1.2-1.5 mm long. Flowers 3-4 mm long, white, tinged with yellow; floral bracts ovate-lanceolate. Sepals similar; dorsal sepal 1.4-2.3 × 0.4-1 mm, oblong-ovate; lateral pair 1.5-2.4 × 0.5-1 mm, connate at base to form a short mentum. Petals 1.3-1.9 × 0.7-1.9 mm, oblong-ovate, obtuse. Lip 0.9-2.2 × 0.7-0.9 mm, simple, clawed, oblong-lanceolate, broadly sagittate-cordate at base, apiculate, margins inrolled, minutely ciliolate; disc ecallose. Column 0.6-0.9 mm long, stout, steldia basal, apex 2-lobulate; pollinia 4.

Flowering : July – September; Fruiting: August – October.
Specimen cited : Godok Busty 1000 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1355**, dt. 23. 07. 2010.
Status : Rare.

- Local distribution : Kafer, Todey, Toroyok, Takdah, Sonada-Pacheng,
1000 – 2000 m.
- General distribution : India (North East India, Sikkim, West Bengal);
Bangladesh, Bhutan, China.

Subtribe **Thelasiinae** Schltr.

Phreatia Lindl.

Plants perennial epiphytic herb. Stems pseudobulbous or caulescent. Leaves 2-3, distichous to flabellate, erect to spreading, jointed on equitant sheaths. Inflorescences lateral, axillary, racemose, densely many-flowered. Flowers minute, resupinate; pale green or white. Sepals and petals similar, spreading; lateral sepals adnate to column foot to form a mentum. Lip entire or obscurely 3-lobed, concave. Column short, with a distinct foot; pollinia 8.

The genus *Phreatia* Lindl., comprises about 150 species distributed from Mainland Asia, through South East Asia to Australia, New Guinea and the Pacific Islands.

Phreatia elegans Lindl., Gen. Sp. Orchid. Pl.: 63. 1830; Hook. f., Fl. Brit. India 5: 810. 1890; Bruhl, Guide Orch. Sikkim. 147. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 445-446. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 111. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 598-600. 1998; Bose *et al.* Orch. India. 395. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 395-397, t. 396. 2002; Lucksom, Orch. Sikkim N.E. Himal. 588. t. 599, pl. 25. 2007; Misra, Orch. India. 313. 2007.

Thelasis elegans (Lindl.) Bl., Mus. Bot. 2: 187. 1856.

Plant epiphytic herb, 14-23 cm tall. Stems pseudobulbous, densely tufted. Leaves 2-3, 6-20 × 1.3-2.7 cm, narrowly elliptic, acute, distichous, narrowed into tubular sheaths. Inflorescence 12-27 cm long, longer than the leaves, densely many-flowered; peduncle 9-15 cm long, erect, glabrous; rachis 4-12 cm long, glabrous; pedicellate-ovary 2.5-3 mm long, curved. Flowers 2.8-3 mm across, white; floral bracts equaling or somewhat longer than the ovary. Dorsal sepal 1.5-2 × 1-1.4 mm, ovate, acute; lateral pair 1.2-1.6 × 1-1.2 mm, triangular, acute, gibbous-saccate at base, adnate to the column foot; mentum rounded. Petals 0.9-1.2 × 0.8-0.9 mm, ovate-elliptic, acute. Lip 1.5-2 mm long, clawed, orbicular. Column 0.5-0.8 mm long, truncate; foot short. Anther ovate; pollinia 8.

- Flowering : August – September; Fruiting: September – October.
- Specimen cited : Tungsong 1700 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1816**, dt. 13. 09. 2012.

Status	: Rare
Local distribution	: Lava, Algarah, Gumbadara, Toroyok, Damsang gari, 1500 – 2000 m
General distribution	: India (North East India, Sikkim, West Bengal); Sri Lanka.

Thelasis Bl.

Plants epiphytic herbs. Stems either pseudobulbous, with sheaths and sometimes additional smaller leaves at base. Leaf solitary or 2, in 2 opposite ranks, lateral compressed and overlapping at base. Leaves narrow, thin. Inflorescence lateral, racemose, many-flowered. Flowers small, resupinate. Sepals and petals similar, spreading at apex. Column short, foot absent; pollinia globose.

The genus *Thelasis* Bl., comprises about 20 species distributed from India eastwards to New Guinea and the Pacific Islands.

Key to the species

1. Flowers 5-7 mm across;
leaf more than 7 cm long..... *T. longifolia*
- 1a. Flowers 2.5-3 mm across;
leaf less than 7 cm long..... *T. pygmaea*

Thelasis longifolia Hook. f., Fl. Brit. India 6(1): 87. 1890; Icon. Pl. 22: t.2155. 1894. *et* Hook., Ic. Pl.t. 2155. 1893; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 250. t. 332. 1898; Bruhl, Guide Orch. Sikkim. 147. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 445. 1979; Hedge, Orch. Arun. Pradh. 54. 1984; Deva & Naithani, Orch. N.W. Himal. 421. t. 420. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 662. 1998; Bose *et al.* Orch. India. 447. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 397 & 399. 2002; Lucksom, Orch. Sikkim N.E. Himal. 589. t. 600, pl. 25. 2007; Misra, Orch. India. 317. 2007.

Plant epiphytic herb, 16-25 cm tall. Pseudobulbs 1.3-2.5 × 1.2-2.7 cm wide, conical. Leaf solitary, 9-18 × 1.3-2.2 cm, arising from pseudobulb apex, narrowly oblong to oblanceolate, tapering to sessile base. Inflorescence arising from new pseudobulb, 20 to 30-flowered; peduncle 14-19 cm tall, glabrous; rachis 3.5-4.6 cm long, glabrous; pedicellate-ovary 2.5-2.9 mm long. Flowers 0.5-0.7 cm across, greenish-white; floral bracts minute. Sepals sub-equal; dorsal sepal 4-4.5 × 1-1.4 mm ovate-elliptic; lateral pair 4.4-5 × 2.2-2.7 mm, ovate, obtuse. Petals 3-3.6 × 1-1.3 mm, narrowly ovate,

acute. Lip 4-4.5 × 2-2.5 mm, elliptic-ovate, entire, emarginated apex, ecallose. Column 1-1.5 mm long, tapering to apex. Anther beaked; pollinia globose.

Flowering : July – September; Fruiting: August – October.
Specimen cited : Najoke forest 600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 9290**, dt. 08. 09. 2009.
Status : Rare.
Local distribution : Lathpanjar forest, Suruk, Pudung, Panbu, Nimbong, 600 – 1000 m.
General distribution : India (Sikkim, West Bengal).

Thelasis pygmaea (Griff.) Bl., Fl. Javae nov. ser.: 22. 1858; Hook. f., Fl. Brit. India 6: 86. 1890; Bruhl, Guide Orch. Sikkim. 147. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 443. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 662. 1998; Bose *et al.* Orch. India. 447. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 399, t.398. 2002; Lucksom, Orch. Sikkim N.E. Himal. 589-590. t. 601, pl. 25. 2007; Misra, Orch. India. 317. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1548. 2012.

Euproboscis pygmaea Griff., Calcutta J. Nat. Hist. 5: 372, t.26. 1844.

Thelasis elongata Bl., Mus. Bot. 2: 187. 1856.

T. pygmaea var. *multiflora* Hook. f., Fl. Brit. India. 6(1): 86. 1890.

T. hongkongensis Rolfe, Bull. Misc. Inform. Kew 1896: 199. 1896.

T. clausa Fukuyama, Bot. Mag. (Tokyo) 49: 440. 1935.

Plants epiphytic herb, clustered, 7-10 cm tall. Pseudobulbs ovoid-globose. Leaf solitary or 2, 3-8 × 1.2-1.4 cm, linear-oblong, sessile, tip unequally notched. Inflorescence 5-8 cm long, arising from base of pseudobulbs, densely many-flowered; peduncle 4-6 cm tall, sheathed; rachis 1-2 cm long; pedicellate-ovary 1-1.5 mm long. Flowers 2.5-3 mm across, pale-green; floral bracts ovate. Dorsal sepal 2.7-3 × 0.9-1.1 mm, ovate-lanceolate, acute; lateral pair 3.5-4 × 1-1.1 mm long, linear-oblique, keeled, connate at base. Petals 2.5-3 × 0.9-1 mm, oblong, obtuse, apices recurved. Lip 2.5-3 × 1.4-1.6 mm, slightly 3-lobed; side lobes erect, rounded; apical lobe oblong, obtuse; ecallose. Column c. 2.5 × 0.8 mm, acute apex. Anther beaked; pollinia globose.

Flowering : August – September; Fruiting: September – October.
Specimen cited : Neol forest 550 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0681**, dt. 16. 08. 2008.
Status : Common.
Local distribution : Kumsi, Yangmakum, Najoke, Seokbir khani, Kumai, Sittong, Neol forest, Mangmaya, Gasoke, 250 – 900 m.

General distribution : India (Sikkim, West Bengal); Burneo, China, Japan, Java, Malaysia, Nepal, Philippines, Sumatra, Thailand and Vietnam.

Tribe **Dendrobieae** Endlicher

Subtribe **Dendrobiinae** Lindl.

Dendrobium Sw.

Plants perennial epiphytic or lithophytic herbs. Stems rhizomatous or erect and many-noded, lacking a rhizome, new stems many-noded, arising from base of the old ones; tough and fleshy, swollen at base or along whole length, often pseudobulbs and covered with sheathing leaf bases. Leaves solitary to many, apical from pseudobulb or arranged distichously along stem, linear-lanceolate, oblong or ovate, papery or coriaceous, tip usually 2-lobed or emarginated. Inflorescence racemes, 1 to many-flowered, erect, horizontal or pendent, lateral or terminal. Flowers often showy, resupinate or non-resupinate. Sepals subequal; lateral pair adnate to the elongate column foot to form a spur-like mentum. Petals similar to sepals. Lip entire to 3-lobed, base joined to the column foot, often forming a closed spur with the lateral sepals; disc 1 to 7-keeled, usually ecallose. Column produced into a foot; pollinia 4.

The genus *Dendrobium* Sw., comprises about 1400 species distributed from India across to Japan, South to Malaysia, Indonesia and East to New Guinea, Australia, New Zealand and the Pacific Islands.

Key to the species

1. Plants with fusiform to clavate stems, often angled,
sometimes compressed; nearly sheathless, clustered at apex.....2
- 1a. Plants without fusiform to clavate stems, leaves
with distinct sheaths.....7
2. Stem solitary-leaved.....3
- 2a. Stem 2-5 leaved.....4
3. Pseudobulbs appressed to substrate, 2-5 cm long;
solitary or 2-flowered.....*D. jenkinsii*
- 3a. Pseudobulbs erect, 6-10 cm long; 7 to many flowered.....*D. lindleyi*

4. Sepals and petals yellow.....5
4a. Sepals and petals white.....*D. farmeri*
5. Leaves close together on many-angled stems;
floral bracts large; flowers in dense inflorescence;
lip margin long ciliate*D. densiflorum*
- 5a. Leaves lax on few angled stems; floral bracts minute;
flowers in lax inflorescence; lip margin
papillate or crenulate-ciliate.....6
6. Stems laterally compressed; petals entire; lip
boat shaped, concave, papillae long margin.....*D. sulcatum*
- 6a. Stems not compressed; petals minutely
dentate at margin; lip orbicular, flat,
crenulate-ciliate along margin.....*D. chrysotoxum*
7. Stem with at least some of the internodes either fleshy or swollen8
7a. Stems compressed or wiry, without fleshy or swollen internodes32
8. Flowers terminal or subterminal, white
with yellow lamellae on lip*D. longicornu*
- 8a. Flowers usually from nodes of leafy or leafless stems,
greenish purple marking, without coloured marking on lip.....9
9. Plants tufted, smaller; stems with few internodes;
inflorescence terminal or lateral arising at an
acute angle to stems, on long scapes.....10
- 9a. Plants not tufted, larger; stems with many internodes;
inflorescence lateral, arising vertically
on stems on short scapes12
10. Plants small; stems pseudobulbous, cylindric to
conical, usually 3-5 cm long.....*D. porphyrochilum*
- 10a. Plants medium; stems fusiform, tapering towards
apex or nearly cylindrical, more than 4 cm long.....11
11. Flowers greenish-yellow; dorsal sepal more than
1.5 cm long; mentum c. 3 mm long*D. denudans*
- 11a. Flowers pale-green; dorsal sepal less than
1.5 cm long; mentum c. 8 mm long*D. eriiflorum*

12. Flowers usually with a large, narrow mentum	13
12a. Flowers usually with a short, saccate mentum	14
13. Lip simple, callus lacking at base	<i>D. cumulatum</i>
13a. Lip 3-lobed, with two calli at base	<i>D. amoenum</i>
14. Flowers 1.2-4.5 cm across; lip 3-lobed (except <i>D. transparens</i> , <i>D. aduncum</i>); disc with ornaments	15
14a. Flowers more than 3.5 cm across; lip without side lobes; disc without ornaments except for a callus at base	20
15. Lip without side lobes.....	16
15a. Lip with side lobes	17
16. Disc with a pubescent transversal wall separating hypochile and epichile	<i>D. aduncum</i>
16a. Disc pilose, with a central, fleshy, sulcate line	<i>D. transparens</i>
17. Petals entire; lip not ciliate at margin.....	18
17a. Petals finely erose-dentate at distal end; lip densely, finely long ciliate at margin.....	19
18. Flowers pale-green, marked with red; dorsal sepal ovate-lanceolate; mentum urceolate.....	<i>D. bicameratum</i>
18a. Flowers white; dorsal sepal lanceolate; mentum rounded	<i>D. candidum</i>
19. Inflorescence 2 or 3-flowered; sepals and petals pure white; lip with dull yellow patch	<i>D. stuposum</i>
19a. Inflorescence 2-4-flowered; sepals and petals purplish-yellow with purple margins; lip without yellow patch	<i>D. praecintum</i>
20. Sepals and petals bright yellow to copper or coral red, never purple except sometimes on lip	21
20a. Sepals and petals purple or white, with purple tinge or dots, rarely pure white or creamy.....	26
21. Lip edges strongly branched-fimbriate	22
21a. Lip edges not branched-fimbriate, erose-dentate or ciliate at margin	23

22. Lip without blotch.....*D. fimbriatum*
22a. Lip with a central purple blotch*D. fimbriatum*
var. *oculatum*
23. Lip margin incurved forming a pouch,
long ciliate veins within*D. moschatum*
23a. Lip margin not forming a pouch,
without long ciliate veins within24
24. Leaves present during flowering25
24a. Leaves absent during flowering*D. heterocarpum*
25. Stem pendent; lip with two dark blotches at centre*D. chrysanthum*
25a. Stem erect or deflex; lip with one dark blotch at centre*D. ochreatum*
26. Stems with swollen nodes or internodes alternating
with constrictions.....27
26a. Stems without swollen nodes and internodes28
27. Stems branched, thin, wiry; inflorescence
solitary-flowered; disc dark-purple at centre*D. falconeri*
27a. Stems not branching, thick, fleshy; inflorescence more
than 2-flowered; disc with or without blotches at centre*D. pendulum*
28. Petals finely ciliate or serrulate at margin*D. devonianum*
28a. Petals not ciliate and serrulate at margin29
29. Basal callus on lip splitting up in 3 keels entering about
one third into the disc.....30
29a. Basal callus on lip if any, fading into the disc
without splitting up in keels.....31
30. Leaves oblong or lanceolate, obliquely
emarginated at tip; sepals and petals
equal in breadth; operculum purple*D. primulinum*
30a. Leaves linear-lanceolate, acuminate at tip;
petals broader than the sepals; operculum white*D. aphyllum*
31. Petals twice as broad as dorsal sepal or more*D. nobile*
31a. Petals not twice as broad as dorsal sepal*D. crepidatum*
32. Leaves laterally compressed.....33
32a. Leaves dorsicentral*D. cathcartii*
33. Flowers strictly terminal, white or pale-pink.....*D. terminale*
33a. Flowers lateral or terminal, yellow to yellowish-green*D. anceps*

Dendrobium aduncum Wall. ex Lindl., Bot. Reg. 28: misc.58, no.62. 1842; Hook. f., Fl. Brit. India 5: 730. 1890; Bruhl, Guide Orch. Sikkim. 60. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 324. 1979; Hedge, Orch. Arun. Pradh. 60. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 283. 1998; Bose *et al.* Orch. India. 190. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 415. 2002; Lucksom, Orch. Sikkim N.E. Himal. 626. t. 665. 2007; Misra, Orch. India. 291. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Callista adunca (Wall. ex Lindl.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Dendrobium faulhaberianum Schltr., Orchis 5: 58, t.5. 1911.

D. aduncum var. *faulhaberianum* (Schltr.) Tang & Wang, Acta Phytolax. Sin. 1 (1): 80. 1951.

Plant epiphytic herb, 29-48 cm long. Stems 2.4-4.2 mm wide, branched, grooved, sheathed. Leaves 6-10, 5.6-8.9 × 0.7-1.6 cm, oblong-lanceolate, acute, emarginated, sessile. Inflorescence lateral, 3 or 4 flowered; peduncle 0.6-1 cm long, sheathed; rachis 0.5-1 cm long, slender, zigzag; pedicellate-ovary 1.1-0.2 cm long. Flowers 2-2.4 cm across, pale-purple; floral bracts elliptic-ovate. Dorsal sepal 1-1.5 × 0.7-0.9 cm, ovate, acute to acuminate; lateral pair 1.2-1.7 × 1-1.3 cm, triangular to sub rhombic, adnate at base to form a mentum. Petals 1-1.3 × 0.6-0.7 cm, ovate, acute to acuminate. Lip 1-1.2 × 0.6-0.7 cm, shortly clawed, broadly elliptic, apex acuminate, margins entire; disc with a hairy transversal wall separating hypochile and epichile. Column with beaked, rounded appendages apically. Anther dome shaped; pollinia 4.

Flowering : May – July; Fruiting: June – August.
Specimen cited : Kumsi forest 750 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1286**, dt. 04. 07. 2010
Status : Rare.
Local distribution : Panighatta, Kumsi, Guling forest, Pareng, Majitar, 250 – 900 m.
General distribution : India (Sikkim, West Bengal, Assam, Meghalaya); Bhutan, China, Myanmar, Thailand and Vietnam.

Dendrobium amoenum Wall. ex Lindl., Gen. Sp. Orchid. Pl.: 78. 1830; Hook. f., Fl. Brit. India 5: 738. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 49, t. 69. 1898; Bruhl, Guide Orch. Sikkim. 63. 1926; Tuyama in Hara, Fl. E. Himal. 2: 184. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 314-315. 1979; Banerji, Orch. Nepal. 58. 1982; Deva & Naithani, Orch. N.W. Himal. 241 – 243. t. 242. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 283. 1998; Bose *et al.* Orch. India. 190. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 405-406. 2002; Lucksom, Orch. Sikkim N.E. Himal. 616-617. t. 648, pl. 26. 2007; Misra, Orch. India. 291. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* Ind. Forest. 140(4): 413-418. 2014; Chowdhery & Agrawala, A Century W.H. Orch. 150. 2013.

Dendrobium egertoniae Lindl., Bot. Reg. 33: sub t.36. 1847.

D. mesochlorum Lindl., loc. cit. 1847.

Callista amoena (Wall. ex Lindl.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Plant epiphytic herb, 18-66 cm tall. Stems thickened at nodes, erect to suberect. Leaves many, 6.5-18 × 0.6-1.9 cm, oblong-lanceolate, acute, oblong, sessile. Inflorescence lateral, 2 or 3-flowered; peduncle 8 mm long; pedicellate-ovary 2.7-3 cm long, slender. Flowers 4.5-5 cm across, white suffused with purple; floral bracts ovate. Sepals similar, oblong-lanceolate, obtuse to acute; mentum conical. Dorsal sepal 2.4-2.6 × 0.8-0.9 cm; lateral pair 3-3.3 × 0.9-1.1 cm. Petals 2.6-3.3 × 1.1-1.3 cm, ovate, obtuse to acute. Lip 3-3.4 × 1.9-2.2 cm, 3-lobed, white flushed with greenish yellow centrally and an apical purple spotted clawed at base, oblong-obovate; side lobes rounded, convolute; apical lobe orbicular, margins fimbriate, puberulous. Column 0.8-1 cm long, broad at apex; foot tapering. Anther dome shaped; pollinia 4.

Flowering : May – June; Fruiting: June – August.

Specimen cited : Suruk Busty 600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0376**, dt. 12. 05. 2008.

Status : Sparse.

Local distribution : Samalbung Busty, Jaldhaka, Lesh khola, Reyang, 300 – 800 m.

General distribution : India (Sikkim, West Bengal); Bhutan, Nepal.

Dendrobium anceps Sw., Kongl. Vetensk. Acad. Nya. Handl. 21: 246. 1800; Hook. f., Fl. Brit. India 5: 724. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 41, t. 54. 1898; Bruhl, Guide Orch. Sikkim. 56. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 344. 1979; Banerji, Orch. Nepal. 58. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 287. 1998; Bose *et al.* Orch. India. 190. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 422. 2002; Lucksom, Orch. Sikkim N.E. Himal. 635. t. 680. 2007; Misra, Orch. India. 292. 2007; Yonzone *et al.* Golden Res. Thoug. 1(6): 21 – 22. 2011; *et Asian J. Pharm. Lif. Sci.*, 1(4): 457. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1540. 2012; *et Ind. Forest.* 140(4): 413-418. 2014.

Aporum anceps (Sw.) Lindl., Gen. Sp. Orchid. Pl.: 71. 1830.

Callista anceps (Sw.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Plant epiphytic herb, 13-36 cm tall. Stem laterally compressed, sheathed, branched. Leaves many, 2.5-5 × 0.6-1.3 cm, distichous, overlapping, equitant, fleshy, lanceolate, acute, sessile. Inflorescences lateral, arising from nodes between leaf-sheaths, 1-flowered; peduncle attenuate; pedicellate-ovary 0.4-0.5 cm long. Flowers 1.2-1.5 cm across, yellowish-green; floral bracts minute, oblong. Dorsal sepal 0.4-0.5 × 0.4-0.5 cm, elliptic, subacute; lateral pair 1.1-1.3 × 0.4-0.5 cm, elliptic, obtuse, falcate, adnate at base to form a mentum; mentum obtuse. Petals 0.3-0.4 × 0.2 cm, broadly elliptic, obtuse. Lip 0.7-1.4 × 0.7-0.8 cm, wedge shaped to oblong, obscurely

3-lobed, apex 2-lobed, margins entire. Column 1-1.5 mm long; foot short. Anther white; pollinia 2.

Flowering : March – June; Fruiting: May – July.
Specimen cited : Sevoke forest 280 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0243**, dt. 19. 03. 2008.
Status : Sparse.
Local distribution : Kalijhora, Rambhi, Mungpoo, Pankhabari, Malli-Kalimpong, 150 – 600 m.
General distribution : India (North East India, Sikkim, West Bengal); Bhutan, Indo China, Myanmar, Nepal and Thailand.

Note: Intraspecific flower colour variation in the population of *Dendrobium anceps* Sw. [Plate 4.13]

Colour variation was observed in lateral sepals, dorsal sepals, petals, lip and mentum foot and where instead light green colour, pinkish grey was observed. However, the minute colour variation is not the criteria to place it into a new species or variety. Thus, the variation observed in lip and mentum foot may be due to environmental influence.

The intraspecific variation can be easily recognized with pinkish grey flower colour, 1.3-1.4 cm across (lateral pair to lateral pair); dorsal sepal 0.5 × 0.4 cm; lateral pair 1.1-1.2 × 0.5 cm; petals 0.3-0.4 × 0.2 cm; lip pinkish grey color 1.1-1.2 × 0.5-0.6 cm. Mentum foot is pinkish grey. Drastic colour variation found on lip and mentum foot of floral parts. A, A1, A2 and A3 are the variation occurred within the species and the B, B1, B2 and B3 are the type species. On observation, there were flowers with pinkish grey colour instead of light green colour. Present variation is absolutely based on colour of floral parts especially lip and mentum foot and is concluded that, it is neither a new species nor a variety or forma but intraspecific variation on the population of *Dendrobium anceps* Sw.

Dendrobium aphyllum (Roxb.) C.E.C. Fischer, Gamble, Fl. Madras 3: 1416. 1928; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 321. 1979; Hedge, Orch. Arun. Pradh. 60. 1984; Deva & Naithani, Orch. N.W. Himal. 243. t. 244. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 65. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 287. 1998; Bose *et al.* Orch. India. 190. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 406-407. 2002; Lucksom, Orch. Sikkim N.E. Himal. 623-624. t. 661, pl. 28. 2007; Misra, Orch. India. 292. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1540. 2012; *et Ind. Forest.* 140(4): 413-418. 2014. Chowdhery & Agrawala, A Century W.H. Orch. 154. 2013; Misra, Orch. Odisha. 300-301. 2014.

Limodorum aphyllum Roxb., Pl. Coromandel 1: 34, t.41. 1795.

Cymbidium aphyllum (Roxb.) Sw., Kongl. Vetensk. Acad. Nya. Handl. 6: 73. 1799.

Dendrobium cucullatum R. Br., Bot. Reg. 7: t.548. 1821.

D. pierardii Roxb. ex Hook., Exot. Fl. 1: t.9. 1822; Hook. f., Fl. Brit. India 5: 738. 1890; Bruhl, Guide Orch. Sikkim. 63. 1926; Tuyama in Hara, Fl. E. Himal. 1: 433. 1966; Tuyama in Hara, Fl. E. Himal. 2: 185. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 140. 1975; Banerji, Orch. Nepal. 64. 1982.

D. pierardii var. *cucullatum* (R. Br.) Hook. f., Fl. Brit. India 5(2): 738. 1890.

Callista aphylla (Roxb.) Kuntze, Revis. Gen. Pl. 2: 653. 1891.

Dendrobium madrasense A.D. Hawkes, Orquidea (Rio de Janeiro) 25(3): 102. 1963.

D. aphyllum var. *cucullatum* (Hook. f.) Sarkar, J. Econ. Taxon. Bot. 5(5): 1007. 1984. [Plate 4.14]

Plant epiphytic herb, 25-64 cm long. Stem pendent, slender, expanded at nodes. Leaves many, 5-10 × 2.5-3 cm, linear-lanceolate, acuminate, sessile, distichous. Inflorescence lateral, 1 to 3-flowered; peduncle attenuate; pedicel and ovary 2-3 cm long. Flower 3.5-4.5 cm across, purplish-white; floral bract ovate. Sepals subequal, oblong-lanceolate, subacute; dorsal sepal 2.5-2.8 × 0.8-1.1 cm; lateral pair 2.6-2.9 × 0.8-1 cm, adnate at base to form a mentum. Petals 2.1-2.4 × 1-1.2 cm, broader than the sepal, ovate-lanceolate, obtuse. Lip 2.5-2.7 × 1.3-2.4 cm, shortly clawed, pale yellow with purple lines at base, suborbicular, convolute over the column. Column 6-7 mm long, white. Anther truncate; pollinia 4.

Flowering	: March – June; Fruiting: May – July.
Specimen cited	: Suruk Busty 650 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0276 , dt. 07. 04. 2008.
Status	: Frequent.
Local distribution	: Jholung, Samalbong, Samthar Busty, Kumsi, Birik, Kambal, Mungpoo, Godok, Tarkhola, Tindharey, Majitar, 300 – 1800 m.
General distribution	: India (Sikkim, West Bengal); Bhutan, China, Malaysia, Myanmar, Nepal, Thailand and Vietnam.

Dendrobium bicameratum Lindl., Bot. Reg. 25: misc.59, no.85. 1839; Hook. f., Fl. Brit. India 5: 729. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 42, t. 56. 1898; Bruhl, Guide Orch. Sikkim. 56. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 323. 1979; Hedge, Orch. Arun. Pradh. 60. 1984; Deva & Naithani, Orch. N.W. Himal. 243. t. 245. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 287-290. 1998; Bose *et al.* Orch. India. 192. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 415-416. 2002; Lucksom, Orch. Sikkim N.E. Himal. 625-626. t. 664, pl. 29. 2007; Misra, Orch. India. 292. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* Ind. Forest. 140(4): 413-418. 2014; Chowdhery & Agrawala, A Century W.H. Orch. 156. 2013; Misra, Orch. Odisha. 284-285. 2014.

Dendrobium bolboflorum Falconer ex Hook. f., Fl. Brit. India 5(2): 729; Icon. Pl. t.2028. 1890.

Callista bicamerata (Lindl.) Kuntze. Revis. Gen. Pl. 2: 654. 1891.

C. bolboflora (Falconer ex Hook. f.) Kuntze, *loc. cit.* 1891. [Fig. 4.24]

Plant epiphytic herb, 13-31 cm tall. Stems fusiform to clavate, ridged, sheathed. Leaves 2-6, 3.5-8.4 × 0.8-2.5 cm, elliptic-lanceolate, acute, obliquely emarginated, tapered and sheathing at base. Inflorescence lateral, short, subcapitate, 4 to 6-flowered; peduncle short; rachis 4-7 mm long, slightly zigzag; pedicellate-ovary short. Flowers 1-1.3 cm across, pale-green streaks of purplish-red; floral bracts lanceolate. Dorsal sepal 0.7-0.8 × 0.5-0.6 cm, ovate-lanceolate, acute; lateral pair 0.7-0.8 × 0.5-0.6 mm, triangular, subacute, concave, adnate at base to form a mentum. Petals 0.5-0.7 × 0.4-0.5 cm, broadly elliptic, obtuse. Lip 0.6-0.7 × 0.6-0.65 cm, oblong-ovate, 3-lobed, base narrow; side lobes triangular, acute, erect; apical lobe short, truncate, oval, apex acute; disc with callus. Column 2-3 mm, oblong; foot 2-loculate. Anther oblong-ovate; pollinia 4.

Flowering : July – August; Fruiting: August – September.
Specimen cited : Todey forest 1500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0551**, dt. 14. 07. 2008.
Status : Rare.
Local distribution : Lungshel, Lopchu, Rambi forest, 500 – 2100 m.
General distribution : India (Sikkim, West Bengal); Bhutan, Myanmar and Nepal.

Dendrobium candidum Wall. ex Lindl., Bot. Reg. 24: misc.36, no.54. 1838; Hook. f., Fl. Brit. India 5: 735. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 49, t.68. 1898; Bruhl, Guide Orch. Sikkim. 60. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 313. 1979; Banerji, Orch. Nepal. 58. 1982; Deva & Naithani, Orch. N.W. Himal. 247. t. 246. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 290. 1998; Bose *et al.* Orch. India. 194. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 407. 2002; Lucksom, Orch. Sikkim N.E. Himal. 616. t. 373, pl. 26. 2007; Misra, Orch. India. 292. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Dendrobium spathaceum Lindl., J. Proc. Linn. Soc., Bot. 3: 15. 1859; Hook. f., Fl. Brit. India 5: 735. 1890.

Callista candida (Wall. ex Lindl.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

C. spathacea (Lindl.) Kuntze, Revis. Gen. Pl. 2: 655. 1891.

Dendrobium officinale Kimura & Migo, J. Shanghai Sci. Inst. Sec.3.3: 122, t.6a,7,9. 1936.

Plant epiphytic herb, 23-36 cm tall. Stems slender, cylindrical, sheathed. Leaves 4-9, 3-6.5 × 0.7-1.3 cm, lanceolate, obtuse, obliquely emarginated, sessile. Inflorescence lateral, 1 to 3-flowered; peduncle 5-7 × 3 mm, slender; rachis 6-8 mm long, slightly zigzag; pedicellate-ovary 1.5-1.9 cm long, slender. Flowers 1.4-2.5 cm across, white; floral bracts spathulate. Sepals lanceolate, subacute to obtuse, subequal; dorsal sepal 1.5-1.8 × 0.3-0.4 cm; lateral pair 1.4-2 × 0.8-0.9 cm, slightly falcate; mentum

rounded. Petals 1.5-1.8 × 0.7-0.9 cm, lanceolate, acute. Lip 1.3-1.5 × 0.8-1 cm, oblong-lanceolate, 3-lobed, shortly clawed; side lobes rounded, incurved; epichile acute; disc with an elongate callus expanded at apex. Column 4-5 mm; foot broad. Anther white; pollinia yellow.

Flowering : May – June; Fruiting: June – July.
Specimen cited : Ramam forest 2400 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0457**, dt. 28. 05. 2008.
Status : Sparse.
Local distribution : Gorkhey, Megma, Rachela, Algarah, 1000 – 2600 m.
General distribution : India, (North East India, Sikkim, West Bengal); Myanmar and Nepal.

Dendrobium cathcartii Hook. f., Fl. Br. India 5(2): 727. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 43, t. 57. 1898; Bruhl, Guide Orch. Sikkim. 59. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 342. 1979; Hedge, Orch. Arun. Pradh. 60. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 67. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 290. 1998; Bose *et al.* Orch. India. 194. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 423 & 425, t. 424. 2002; Lucksom, Orch. Sikkim N.E. Himal. 634. t. 678. 2007; Misra, Orch. India. 292. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* Ind. Forest. 140(4): 413-418. 2014; Misra, Orch. Odisha. 280-281. 2014.

Grastidium cathcartii (Hook. f.) M.A. Clements & D.L. Jones, Lasianthera 1(2): 67. 1997.

Plant epiphytic herb, 34-74 cm tall. Stems terete, internodes yellowish, sheathed. Leaves many, 7.5-12 × 0.9-1.3 cm, jointed, linear-lanceolate, obliquely notched, sessile, distichous. Inflorescence lateral, 2-flowered; peduncle 3-4 mm long, attenuate; pedicellate-ovary 1.2-1.4 cm long, slender. Flowers 1.3-1.9 cm across, yellow; floral bracts lanceolate. Dorsal sepal 0.8-1 × 0.3-0.5 cm, ovate-lanceolate, acute; lateral pair 0.9-1.2 × 0.4-0.7 cm, lanceolate, adnate at base to form a mentum. Petals 0.8-0.9 × 0.3-0.4 cm, linear-lanceolate, acute. Lip 0.9-1.3 × 0.5-0.6 cm, simple, yellow marked with purple, entire, elliptic-oblong, acute. Column broad; foot narrow, elongate. Anther dome shaped; pollinia elliptic-oblong.

Flowering : March – September; Fruiting: May – October.
Specimen cited : Ryang 400 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0237**, dt. 19. 03. 2008.
Status : Rare.
Local distribution : Kalijhora, Sevoke, Dudey, Jaldhaka, Sepkhola, Jholung, Tindharey, 150 – 800 m.

General distribution : India (Arunachal Pradesh, Sikkim, West Bengal);
Bhutan.

Dendrobium chrysanthum Wall. ex Lindl., Bot. Reg. 15: t.1299. 1830; Gen. Sp. Orchid. Pl.: 80 1830; Hook. f., Fl. Brit. India 5: 747. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 55, t.77. 1898; Bruhl, Guide Orch. Sikkim. 62. 1926; Tuyama in Hara, Fl. E. Himal. 2: 184. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 140. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 322. 1979; Banerji, Orch. Nepal. 58-59. 1982; Hedge, Orch. Arun. Pradh. 61. 1984; Deva & Naithani, Orch. N.W. Himal. 247. t. 248. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 68. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 290-293. 1998; Bose *et al.* Orch. India. 194. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 407-408. 2002; Lucksom, Orch. Sikkim N.E. Himal. 624. t. 662, pl. 28. 2007; Misra, Orch. India. 292. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* Ind. Forest. 140(4): 413-418. 2014; Chowdhery & Agrawala, A Century W.H. Orch. 158. 2013.

Dendrobium paxtonii sensu Lindl., Bot. Reg. 25: misc.43. no.56. 1839, *non* Paxton 1839.

D. chrysanthum var. *microphthalma* Rchb. f., Gard. Chron. n.s., 11: 366. 1879.

D. chrysanthum var. *anophthalma* Rchb. f., *op. cit.* 19: 44. 1883.

Callista chrysantha (Wall. ex Lindl.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Plant epiphytic herb, 34-66 cm long. Stem pendent, straight to wavy, sheathed. Leaves many, 7.5-20 × 1.8-4.3 cm, distichous, elliptic-lanceolate, acuminate, sessile. Inflorescence lateral, leaf opposed, 2 to 4-flowered; peduncle attenuate; pedicellate-ovary 4.2-5.5 × 0.2-0.3 cm, slender. Flowers 2.7-3 cm across, yellow; floral bracts ovate. Sepals subequal; dorsal sepal 2-2.3 × 1.2-1.5 cm, oblong-elliptic to ovate, subacute, concave; lateral pair 1.9-2.3 × 1-1.4 cm, slightly falcate, adnate to the foot of column to form short mentum. Petals 2.2-2.5 × 1.5-1.8 cm, elliptic to ovate-orbicular, obtuse. Lip 1.8-2.4 × 2.2-2.7 cm, simple, lip with two separate dark blotches, clawed at base and enclosing the column, margins fimbriate. Column 0.6-0.8 × 0.4-0.5 cm, foot short. Anther dome shaped; pollinia 4.

Flowering : July – October; Fruiting: September – November.

Specimen cited : Algarah forest 1700 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0687**, dt. 06. 09. 2008.

Status : Frequent.

Local distribution : Nokdara, Lava, Todey, Lungsel, Baggonra,
800 – 2200 m.

General distribution : India (Sikkim, West Bengal); Bhutan, China, Laos,
Myanmar, Nepal, Thailand and Vietnam.

Dendrobium chrysotoxum Lindl., Bot. Reg. 33: sub t. 19, t.36. 1847; Hook. f., Fl. Brit. India 5: 750. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 305. 1979; Hedge, Orch. Arun. Pradh. 61. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 293. 1998; Bose *et al.* Orch. India. 194. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 425. 2002; Lucksom, Orch. Sikkim N.E. Himal. 611. t. 641, pl. 26. 2007; Misra, Orch. India. 292. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Callista chrysotoxa (Lindl.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Plant epiphytic herb, 20-46 cm tall. Stem clavate, ribbed. Leaves 3-6, 8-16 × 1.65-4.3 cm, elliptic-oblong, acute, tip unequally 2-lobed, petiolate. Inflorescence 17-26 cm long, 12 to 22-flowered; peduncle 6.5-8 cm long, terete; rachis 10.5-20 cm long with; pedicellate-ovary 2.5-3 cm long, glabrous. Flowers 4-4.8 cm across, yellow; floral bracts ovate. Sepals sub-equal, glabrous, spreading; dorsal sepal 1.7-2.1 × 0.85-1 cm, erect, ovate, obtuse; lateral pair 2-2.5 × 0.7-0.9 cm, oblong-ovate, slightly falcate at base, subacute, adnate at base to form short mentum. Petals 2-2.45 × 1-1.4 cm, obovate-elliptic, obtuse, yellow, glabrous. Lip 2.5-2.7 × 2.3-2.7 cm, orbicular; hypochile erect, enclosing the column, clawed at base; epichile margin ciliolate and crisped, surface glandular-hairy. Column 5.5 × 3.2 mm, with 3-dented apical processes; foot yellow. Anther dome shaped; pollinia oblong.

Flowering : May – June; Fruiting: June – August.
 Specimen cited : Nurserymen’s Heaven, Holumba Floral Nursery
 980 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1613**, dt. 26. 05. 2011.
 Status : Cultivated in earthen pots.
 Local distribution : Kaneybreed Floral Nursery – Kalimpong, 850 – 950 m.
 General distribution : India (Nagaland, Manipur, Mizoram); Cambodia, Java, Laos, Myanmar and Vietnam.

Dendrobium crepidatum Lindl. & Paxt., Paxton’s Fl. Gard. 1: 63, t.45. 1850; Hook. f., Fl. Brit. India 5: 740. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 48, t. 66. 1898; Bruhl, Guide Orch. Sikkim. 59. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 319. 1979; Banerji, Orch. Nepal. 59. 1982; Deva & Naithani, Orch. N.W. Himal. 247 – 251. t. 249. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 69. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 293. 1998; Bose *et al.* Orch. India. 194. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 408-409. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 146-147. 2005; Lucksom, Orch. Sikkim N.E. Himal. 622. t. 659, pl. 28. 2007; Misra, Orch. India. 292. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* Ind. Forest. 140(4): 413-418. 2014; Chowdhery & Agrawala, A Century W.H. Orch. 160. 2013; Misra, Orch. Odisha. 296-297. 2014.

Callista crepidatum (Lindl. & Paxt.) Kuntze, Revis. Gen. PL. 2: 654. 1891. [Plate 4.15]

Plant epiphytic herb, 17-48 cm tall. Stems clustered, terete, jointed, slightly zigzag, sheathed. Leafless at flowering. Leaves 5-11 × 1.5-2.5 cm, oblong-lanceolate, acuminate, distichous, sessile, jointed. Inflorescence lateral, arising from slightly swollen nodes, 1 or 2-flowered; peduncle 1-2 mm long; pedicellate-ovary 2.8-3.5 cm long, glabrous. Flowers 2.2-2.8 cm across, white suffused with purple; floral bracts very minute. Sepals similar, dorsal sepal 1.6-2.2 × 0.6-0.8 cm, elliptic-lanceolate, acute; lateral pair 2.3-2.7 × 0.9-1 cm, elliptic-oblong, acute; mentum short. Petals 1.6-2.2 × 1-1.1 cm, broadly ovate, obtuse. Lip 1.8-2.2 × 1.4-1.9 cm, simple, white with a large yellow central area, purple at apex, clawed, broadly obovate, base with incurved sides, margins slightly undulate, entire. Column 5-6 mm long. Anther dome shaped; pollinia 4.

Flowering : May – June; Fruiting: June – July.
Specimen cited : Nurserymen’s Heaven, Holumba Floral Nursery
980 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0801**, dt. 03. 05. 2009.
Status : Cultivated.
Local distribution : Kaneybreed Floral Nursery–Kalimpong, 850–950 m.
General distribution : India (Sikkim); China, Laos, Myanmar, Nepal,
Thailand and Vietnam.

Dendrobium cumulatum Lindl., Gard. Chron. 1855: 756. 1855; Hook. f., Fl. Brit. India 5: 731. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 46, t.63. 1898; Bruhl, Guide Orch. Sikkim. 58. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 342. 1979; Hedge, Orch. Arun. Pradh. 61. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 34. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 295. 1998; Bose *et al.* Orch. India. 196. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 421. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 148-149. 2005; Lucksom, Orch. Sikkim N.E. Himal. 633-634. t. 677, pl. 28. 2007; Misra, Orch. India. 292. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 457. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Callista cumulata (Lindl.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Dendrobium eoum Ridl., J. Linn. Soc., Bot. 32: 261. 1896.

Pedilonum eoum (Ridl.) Rauschert, Feddes Repert. 94: 459. 1983.

Plant epiphytic herb, 33-54 cm tall. Stems erect, internodes sheathed. Leaves 5-9, 5-9.5 × 1.5-3.6 cm, oblong-lanceolate to elliptic, acute, distichous, sessile, sheathed. Inflorescence corymbiform, 5 to 7-flowered; peduncle 0.7-1.4 cm long, sheathed; rachis 1-1.5 cm long, zigzag, glabrous; pedicellate-ovary 1.8-2.3 cm long, slender. Flowers 3.4-3.9 cm long, white to pale purple; floral bracts lanceolate. Dorsal sepal

1.5-1.7 × 0.7-0.8 cm, elliptic, subcute; lateral pair 2-2.5 × 0.6-0.8 cm, elliptic, subcute, slightly falcate, adnate at base to form a mentum. Petals 1.5-1.8 × 0.9-1.1 cm, obovate, margins undulate. Lip 1.8-2.8 × 0.8-1.3 cm, simple, white with pink patch at apex, yellowish at base, obovate-spatulate, long-clawed at base, apex broad, emarginate, margins erose. Column 6-9 mm long, broad, clavate, winged; foot long. Anther white; pollinia 4.

Flowering : June – July; Fruiting: July – August.
Specimen cited : Nurserymen’s Heaven, Holumba Floral Nursery
980 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1281**, dt. 28. 06. 2010.
Status : Cultivated.
Local distribution : Kaneybreed Floral Nursery – Kalimpong, 850–950 m.
General distribution : India (North East India, Sikkim, West Bengal);
Bhutan, Borneo, Cambodia, Myanmar, Nepal,
Thailand and Vietnam.

Dendrobium densiflorum Lindl., Gen. Sp. Orchid. Pl.: 90. 1830; Hook. f., Fl. Brit. India 5: 748. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 56, t. 79. 1898; Bruhl, Guide Orch. Sikkim. 65. 1926; Tuyama in Hara, Fl. E. Himal. 1: 432. 1966; Tuyama in Hara, Fl. E. Himal. 2: 184. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 305. 1979; Banerji, Orch. Nepal. 59. 1982; Hedge, Orch. Arun. Pradh. 61. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 70. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 295. 1998; Bose *et al.* Orch. India. 198. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 403. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 150-151. 2005; Lucksom, Orch. Sikkim N.E. Himal. 610. t. 639, pl. 26. 2007; Misra, Orch. India. 292. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Dendrobium clavatum Roxb., Hort. Bengal. 63 1814; Fl. Ind. ed. 1832: 481. 1832.

Callista densiflora (Wall. *ex* Lindl.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Plant epiphytic herb, 25-48 cm tall. Stems clavate, obscurely 4 angled, expanding to a swollen node. Leaves 3 or 4, 11-15 × 3-5.8 cm, oblong-lanceolate, acute, shortly petiolate, jointed. Inflorescence pendent, densely many-flowered; peduncle 3-4 cm long; rachis 7-15 cm long; pedicellate-ovary 2.5-3 cm long. Flowers 2.5-3.2 cm across, yellow; floral bracts oblong, revolute. Dorsal sepal 1.7-1.9 × 1-1.2 cm, ovate-elliptic, rounded; lateral pair 1.9-2.2 × 0.9-1.1 cm, elliptic, acute, adnate at base to form a mentum. Petals 1.5-2 × 1-1.4 cm, ovate-orbicular, clawed. Lip 1.9-2.4 × 1.8-2.5 cm, simple, clawed at base, orbicular-rhombic, convolute basally, surface glandular- hairy, margins lacerate. Column 5-6 mm long, broad. Anther conical; pollinia 4.

Flowering : April – July; Fruiting: June – August.

Specimen cited	: Suruk Busty 800 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0331 , dt. 24. 04. 2008.
Status	: Sparse.
Local distribution	: Najoke, Relli, Samthar, Suruk, Lopchu, Mungpoo, Pedong, Seokbir khani, East Main Road-Kalimpong, Tungsong, 300 – 2100 m.
General distribution	: India (North East India, West Bengal, Sikkim); Bhutan, Myanmar, Nepal and China.

Dendrobium denudans D. Don, Prodr. Fl. Nepal.: 34. 1825; Hook. f., Fl. Brit. India 5: 715. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 45, t. 62. 1898; Bruhl, Guide Orch. Sikkim. 62. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 338. 1979; Banerji, Orch. Nepal. 59-60. 1982; Deva & Naithani, Orch. N.W. Himal. 251. t. 252. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 71. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 295. 1998; Bose *et al.* Orch. India. 198. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 419. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 152-153. 2005; Lucksom, Orch. Sikkim N.E. Himal. 631-632. t. 673, pl. 29. 2007; Misra, Orch. India. 292. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Callista denudans (D. Don) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Plant epiphytic herb, pendent, 13-27 cm long. Stems suberect, sheathed. Leaves 4-8, 3.2-7.3 × 0.8-1.3 cm, oblong to linear-oblong, acute to subacute, obliquely emarginated, sessile. Inflorescences leaf-opposed, 8 to 15-flowered; peduncle 2.2-4.7 cm long, slender; rachis 3.5-11 cm long; pedicellate-ovary 6-7 mm long, slender, glabrous. Flowers 1.6-2 cm across, greenish-yellow; floral bracts lanceolate. Sepals subsimilar; dorsal sepal 1.5-2 × 0.11-0.16 cm, linear-lanceolate, acuminate; lateral pair 1.6-2 × 0.2-0.3 cm, lanceolate-triangular, acuminate, falcate; mentum 3 mm long. Petals 1-1.5 × 0.1-0.11 cm, linear-oblong, acute to acuminate. Lip 7-9 × 3.6-5 mm, 3-lobed, green with reddish-purple radiating lines, decurved at base; side lobes long, margins serrate-lacerate; apical lobe recurved, obovate, margins serrate; disc with obscurely 3-ridged. Column 2-3 mm long; foot angled to column, curved, hispid. Anther 2; pollinia 4.

Flowering	: September – October; Fruiting: October – December.
Specimen cited	: Mangzing Busty 800 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0109 , dt. 18. 09. 2007.
Status	: Frequent.
Local distribution	: Nimbong, Suruk, Samalbong, Durpin-Kalimpong, Solok-Kalimpong; 600 – 1800 m.
General distribution	: India (North East India, Sikkim, West Bengal); Bhutan and Nepal.

Dendrobium devonianum Paxt., Paxt.'s Mag. Bot. 7: 169 + fig. 1840. Hook. f., Fl. Brit. India 5: 743. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 318. 1979; Hedge, Orch. Arun. Pradh. 61. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 298. 1998; Bose *et al.* Orch. India. 198. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 409. 2002; M. Pradhan, 100 N.E. Indian Orch. 114-115. 2006; Lucksom, Orch. Sikkim N.E. Himal. 621. t. 656, pl. 27. 2007; Misra, Orch. India. 292. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1540-1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Dendrobium pictum Griff. *ex* Lindl., J. Proc. Linn. Soc., Bot. 3: 12. 1859.

D. pulchellum sensu Lindl., *loc. cit.* 1859, *non* Roxb. *ex* Lindl.

D. pulchellum var. *devonianum* (Paxt.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 284. 1861.

Callista devoniana (Paxt.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Plant epiphytic herb, 31-57 cm tall. Stem elongate, slender, swollen at base, jointed, glabrous. Leaves 6-10, 4-8 × 0.7-1.4 cm, ovate-lanceolate, acuminate, sessile, base sheathing. Inflorescence lateral, arising from nodes, 1 to 3-flowered; peduncle short; pedicellate-ovary 2.2-3 cm long, slender. Flowers 2-4 cm across, white suffused with purple; floral bracts lanceolate. Sepals similar; dorsal sepal 2.2-2.7 × 0.6-0.8 cm, oblong-lanceolate, acute; lateral pair 2.5-2.9 × 0.8-1 cm, adnate at base to form a mentum. Petals 2.3-2.6 × 0.9-1.2 cm, lanceolate-ovate, acute, margins finely ciliate. Lip 2.5-2.9 × 2.4-3.2 cm, simple, white suffused with pink, yellow blotches in centre, orbicular-cordate, shortly clawed, margins deeply fimbriate. Column 5-6 mm long, erect, 2-winged towards apex. Anther dome shaped, white; pollinia 2.

Flowering : April – May; Fruiting: May – July.

Specimen cited : Nurserymen's Heaven, Holumba Floral Nursery
980 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0861**, dt. 17. 05. 2009.

Status : Cultivated.

Local distribution : Kaneybreed Floral Nursery – Kalimpong, 850-950 m.

General distribution : India (North East India); Bhutan, China, Myanmar and Thailand.

Dendrobium eriiflorum Griff., Not. Pl. Asiat. 3: 316. 1851; Icon. Pl. Asiat. 3: 307. 1851; Hook. f., Fl. Brit. India 5: 715. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 44, t. 61. 1898; Bruhl, Guide Orch. Sikkim. 61. 1926; Tuyama in Hara, Fl. E. Himal. 1: 432. 1966; Tuyama in Hara, Fl. E. Himal. 2: 184. 1971; Tuyama in Ohashi, Fl. E. Himal. 3: 140. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 338. 1979; Banerji, Orch. Nepal. 60. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 298. 1998; Bose *et al.* Orch. India. 198. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 419-420. 2002; Lucksom, Orch. Sikkim N.E. Himal. 630-631. t. 671, pl. 29. 2007; Misra, Orch. India. 293. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Callista eriiflora (Griff.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Plant epiphytic herb, 16-24 cm tall. Stems erect, clustered, sheathed. Leaves 4-9, 3.2-10 × 1-1.2 cm, oblong-lanceolate, obliquely emarginate, subsessile, jointed. Inflorescences 4-8 cm, lateral and terminal, pendent, 4 to 11-flowered; peduncle 1.7-3.5 cm, sheathed; rachis 2-6 cm long; pedicellate-ovary 0.6-0.7 cm long, slender. Flowers 1.8-2.5 cm across, pale-green; floral bracts membranous. Sepals subsimilar; dorsal sepal 1-1.4 × 0.2-0.3 cm, lanceolate, acuminate; lateral pair 1.1-1.4 × 0.5-0.7 cm, lanceolate, falcate, acuminate, adnate to form a mentum. Petals 0.9-1.2 × 0.8-0.3 cm, linear, acute. Lip 5-8 × 4.5-6 mm, 3-lobed, green with reddish-purple radiating lines, curved, sessile, oblong-ovate; side lobes elongate, margins toothed-serrate; apical lobe acute, recurved margins undulate; disc with a central crest. Column 1.6-2 mm long. Anther white; pollinia 4.

Flowering : September–November; Fruiting: October–December.
Specimen cited : Mangzing Busty 800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0718**, dt. 18. 10. 2008.
Status : Sparse.
Local distribution : Nimbong, Nim forest, Lopchu, Godok, 800–2000 m.
General distribution : India (Arunachal Pradesh, Meghalaya, Nagaland, Sikkim, West Bengal), Bhutan, Nepal and Myanmar.

Dendrobium falconeri Hook., Bot. Mag. 82: t.4944. 1856; Hook. f., Fl. Brit. India 5: 742. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 318. 1979; Hedge, Orch. Arun. Pradh. 62. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 72. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 298. 1998; Bose *et al.* Orch. India. 200. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 409-410. 2002; M. Pradhan, 100 N.E. Indian Orch. 116-117. 2006; Lucksom, Orch. Sikkim N.E. Himal. 620. t. 654, pl. 27. 2007; Misra, Orch. India. 293. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1541. 2012; *et Ind. Forest.* 140(4): 413-418. 2014.

Callista falconeri (Hook. f.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Dendrobium erythroglossum Hayata, Icon. Pl. Formos. 4: 36, t.13a. 1914.

Plant epiphytic herb, 45-75 cm long. Stem slender, branched, pendent, joined, bead-like nodes. Leaves 2-3, 1.6-8.6 × 0.2-0.4 cm, linear-oblong, subacute, sessile, many-nerved. Inflorescence lateral, arising from nodes, solitary flowered; peduncle 1.3-2.9 cm long, glabrous, sheathed at base; pedicellate-ovary 1.6-1.8 cm long, slender, glabrous. Flowers 5-5.9 cm long, white tipped with purple; floral bracts membranous. Sepals spreading; dorsal sepal 3.3-3.6 × 1-1.2 cm, oblong-lanceolate, acuminate; lateral pair 3.3-3.5 × 1.6-1.9 cm, adnate at base to form a spur-like mentum. Petals 3.2-3.4 × 0.9-1.2 cm, elliptic-ovate, acute to acuminate. Lip 3.4-4.2 × 2.1-2.7 cm, slightly 3-lobed, white with central dark purple spot, clawed, apex

acute, softly ciliate, margins dentate-serrate to fimbriate. Column 3-5 mm long; foot short. Anther dome shaped; pollinia yellow.

Flowering : April – June; Fruiting: May – July.
Specimen cited : Nurserymen's Heaven, Holumba Floral Nursery
980 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1151**, dt. 02. 05. 2010.
Status : Cultivated.
Local distribution : Kaneybreed Floral Nursery - Kalimpong, 850–950 m.
General distribution : India (Nagaland, Sikkim); Bhutan, China and Myanmar.

Dendrobium farmeri Paxt., Paxt.'s Mag. Bot. 15: 241 + fig. 1849; Hook. f., Fl. Brit. India 5: 750. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 57, t.80. 1898; Bruhl, Guide Orch. Sikkim. 66. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 306. 1979; Hedge, Orch. Arun. Pradh. 62. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 73. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 298-301. 1998; Bose *et al.* Orch. India. 200. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 403-404. 2002; M. Pradhan, 100 N.E. Indian Orch. 118-119. 2006; Lucksom, Orch. Sikkim N.E. Himal. 611-612. t. 642. 2007; Misra, Orch. India. 293. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Callista farmeri (Paxt.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Plant epiphytic herb, 19-34 cm tall. Stem clavate-fusiform, broadly 4 or 5-ridged, narrowed at base. Leaves 2-3, 8.5-15 × 2.5-5.2 cm, subterminal from pseudobulb, elliptic-lanceolate, acute, narrowed to sessile base. Inflorescence axillary, decurved, pendent, many-flowered; peduncle 2.9-3.6 cm long, sheathed; rachis 7-12 cm long, glabrous; pedicellate-ovary 2.2-2.9 cm long, slender, puberulent. Flowers 2.7-4 cm across, white; floral bracts lanceolate, revolute. Sepals subsimilar; dorsal sepal 1.9-2.2 × 0.8-1.1 cm, ovate-oblong, acute; lateral pair 2.1-2.4 × 0.8-1 cm, adnate at base to form a mentum with the column foot. Petals 1.8-2.1 × 1.4-1.7 cm, suborbicular, obtuse, clawed at base. Lip 1.9-2.3 × 1.6-1.8 cm, dark yellow fading towards white margins, clawed, orbicular, hairy, margin erose. Column 6-7 mm long; foot short. Anther dome shaped; pollinia elliptic oblong.

Flowering : March – May; Fruiting: April – June.
Specimen cited : Kalijhora forest 400 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1140**, dt. 22. 04. 2010.
Status : Threatened.
Local distribution : Sepkhola, Sangsay Bhalukhop, Birik, Kumsi, 200 – 1000 m.

General distribution : India (North East India, Sikkim, West Bengal);
Malaysia, Myanmar, Nepal, Thailand and Vietnam.

Dendrobium fimbriatum Hook., Exot. Fl. 1: t.71. 1823; Hook. f., Fl. Brit. India 5: 745. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 58, t. 82. 1898; Bruhl, Guide Orch. Sikkim. 64. 1926; Pradhan & Pradhan, 100 Beaut. Orch. 74. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 301. 1998; Bose *et al.* Orch. India. 200. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 410. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 154-155. 2005; Lucksom, Orch. Sikkim N.E. Himal. 614. t. 645, pl. 26. 2007; Misra, Orch. India. 293. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014; Misra, Orch. Odisha. 290. 2014.

Dendrobium paxtonii Paxt., Paxt.'s Mag. Bot. 6: 169 + fig. 1839.

D. normale Falconer, Ann. Nat. Hist. 3: 196. 1839; Proc. Linn. Soc. Lond. 1: 14. 1839.

D. fimbriatum var. *oculatum* Hook., Bot. Mag. 71: t.4160. 1845.

Callista oculata (Hook.) Kuntze, Revis. Gen. Pl. 2: 653. 1891.

C. normalis (Falconer) Kuntze, *op. cit.* 655. 1891.

Plant epiphytic herb, 72-109 cm long. Stems erect, arching to pendent, jointed, many-leaved, sheathed. Leaves many, 9-14.5 × 1.5-2.8 cm, narrowly elliptic-lanceolate, acuminate, sessile. Inflorescences lateral, arising from nodes, pendent, 5 to 13-flowered; peduncle 2.5-3 cm long, glabrous; rachis 5-15 cm long, glabrous; pedicellate-ovary 2-2.8 cm long, slender. Flowers 4.3-5.7 cm across, yellow; floral bracts triangular. Dorsal sepal 2.1-3 × 1.1-1.5 cm, oblong-elliptic, obtuse; lateral pair obliquely ovate, adnate at base to form a mentum. Petals 2-2.9 × 1.5-1.7 cm, oblong-elliptic, rounded, clawed. Lip 2.3-3.3 × 2.2-3.4 cm, dark yellow, clawed, suborbicular, densely hairy, margins plumose-fimbriate. Column 2.5-3 mm long, foot short. Anther dome shaped; pollinia 4.

Flowering : March – May; Fruiting: April – June.

Specimen cited : Kumsi forest 650 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1579**, dt. 27. 04. 2011.

Status : Sparse.

Local distribution : Algarah, Nimbong, Pudung, Chisang-Godok, 600 – 1660 m.

General distribution : India (Meghalaya); Myanmar, Nepal and Thailand.

Dendrobium fimbriatum var. *oculatum* Hook., Bot. Mag. 71: t.4160. 1845; Hook. f., Fl. Brit. India 5: 745. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 309. 1979; Hedge, Orch. Arun. Pradh. 62. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 74. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 301. 1998; Lucksom, Orch. Sikkim N.E. Himal. 614. t. 646, pl. 26. 2007; Misra, Orch. India. 293. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541.

2012; *et Ind. Forest.* 140(4): 413-418. 2014; Chowdhery & Agrawala, *A Century W.H. Orch.* 162. 2013.

Callista oculata (Hook.) Kuntze, *Revis. Gen. Pl.* 2: 653. 1891.

Plant epiphytic herb, 46-120 cm tall. Stem sheathed. Leaves many, 9-15 × 1.4-3.6 cm, oblong-lanceolate, acuminate. Inflorescence solitary or 2, 8.5-20 cm long, lateral, pendulous; peduncle 2.5-3 cm long, terete, smooth; rachis 7.5-17 cm long, with 10 to 13-flowered; pedicellate-ovary 2.8-3.3 cm long, smooth, pale-yellow. Flowers 4-4.6 cm across, yellow; floral bracts triangular. Sepals spreading, elliptic-oblong, obtuse; dorsal sepal 2-2.4 × 1.2-1.4 cm; lateral pair 2.9-3.1 × 1.1-1.2 cm, sub-acute. Petals 2.8-3.2 × 1.7-1.8 cm, elliptic-ovate, obtuse, erose margin. Lip 2.7-3.6 × 2.3-3.4 cm long, epichile orbicular, margin crisped, deeply fimbriate; hypochile short, erect, tubular and enclosing the column, base shortly clawed; with a large horizontal semilunar dark brownish-purple band at the centre; behind this horizontal band of dark-purple runs a abroad longitudinal smooth band up to claw from which radiates dark-purple curved horizontal lines. Column 2.5-3 mm long; foot broad. Anther conical; pollinia 4.

Flowering	: March – May; Fruiting: April – June.
Specimen cited	: Suruk Busty 700 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0283 , dt. 07. 04. 2008.
Status	: Rare.
Local distribution	: Relli – Pala, Tindharey, Guling forest, Gorubathan, Pudung, 300 – 1100 m.
General distribution	: India (North India, West Bengal, Sikkim, Uttar Pradesh); Myanmar, Bhutan, China, Laos, Malaysia, Nepal, Thailand and Vietnam.

Dendrobium heterocarpum Lindl., *Gen. Sp. Orchid. Pl.*: 78. 1830; Hook. f., *Fl. Brit. India* 5: 737. 1890; King & Pantl., *Ann. Roy. Bot. Gard. (Calcutta)* 8: 53, t. 74. 1898; Bruhl, *Guide Orch. Sikkim.* 65. 1926; Tuyama in Hara, *Fl. E. Himal.* 2: 185. 1971; Banerji, *Orch. Nepal.* 63. 1982; Deva & Naithani, *Orch. N.W. Himal.* 251 – 255. t. 253. 1986; Chowdhery, *Orch. Fl. Arun. Pradh.* 302. 1998; Bose *et al.* *Orch. India.* 202. 1999; Pearce & Cribb, *Fl. Bhutan*, 3(3): 411-412. 2002; M. Pradhan, 100 *Sikkim Himal. Orch.* 156-157. 2005; Lucksom, *Orch. Sikkim N.E. Himal.* 618-619. t. 651, pl. 27. 2007; Misra, *Orch. India.* 293. 2007; Yonzone *et al.* *Asian J. Pharm. Lif. Sci.*, 1(4): 458. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1541. 2012; *et Ind. Forest.* 140(4): 413-418. 2014; Chowdhery & Agrawala, *A Century W.H. Orch.* 166. 2013. *D. aureum* Lindl., *Gen. Sp. Orchid. Pl.*: 77. 1830; Pradhan, *Indian Orch. Guide Identif. Cult.* 2: 317. 1979; Hedge, *Orch. Arun. Pradh.* 60. 1984; Pradhan & Pradhan, 100 *Beaut. Orch.* 66. 1997.

Callista heterocarpa (Lindl.) Kuntze, *op. cit.* 654. 1891.

Plant epiphytic herb, 18-38 cm tall. Stems fusiform, erect or pendent, caespitose, sheathed. Leaves 5-9, 7-10 × 1.1-2.2 cm, absent during flowering, alternate, oblong-lanceolate, acute, sessile, jointed. Inflorescences lateral, arising from nodes, 1 to 2-flowered; peduncle 2-6 mm long, sheathed; pedicellate-ovary 2.1-2.4 × 0.2-0.3 cm, glabrous, slender. Flowers 4-5.3 cm across, yellow; floral bracts ovate. Sepals 2.5-3.4 × 0.7-0.9 cm, oblong-lanceolate, acute; lateral pair 3.2-3.6 × 1-1.2 cm long, adnate to form a mentum. Petals 2.5-3.2 × 0.8-1.3 cm, ovate, acute. Lip 2.8-3.1 × 1.6-2.3 cm, obscurely 3-lobed, yellow with radiating brownish-purple lines, ovate-lanceolate, base wedge-shaped, convolute and hooded around the column, acute and reflexed at apex, margins fimbriate, pilose centrally. Column 3-4 mm long; foot short. Anther white; pollinia 2.

Flowering	: January – April; Fruiting: March – May.
Specimen cited	: Todey forest 1500 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1081 , dt. 14. 03. 2010.
Status	: Rare.
Local distribution	: Neora Valley, Tangta, Rambi forest, Rimbick, Chimney, 1300 – 2300 m.
General distribution	: India (Meghalaya, Nagaland, Sikkim, West Bengal); Bhutan, China, Laos, Myanmar, Nepal, Thailand and Vietnam.

Dendrobium jenkinsii Wall. *ex* Lindl., Bot. Reg. 25: t.37. 1839; Reichb. f., Walp., Ann. 6: 307, 1861; Pradhan, Indian Orch. Guide Identif. Cult. 2: 303-304. 1979; Hedge, Orch. Arun. Pradh. 63. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 76. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 305. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 404. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 158-159. 2005; Lucksom, Orch. Sikkim N.E. Himal. 608-609. t. 636, pl. 25. 2007; Misra, Orch. India. 293. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Dendrobium aggregatum var. *jenkinsii* (Wall. *ex* Lindl.) King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 61, t.85. 1898; Bruhl, Guide Orch. Sikkim. 55. 1926.

D. marseillei Gagnep., Bull. Mus. Natl. Hist. Nat. ser.2, 6(1): 119. 1934.

Callista aggregata var. *jenkinsii* (Wall. *ex* Lindl.) Grieger, Schltr., Orchideen 3(1): 704, t.517. 1981.

Plant epiphytic herb, 5-7.5 cm tall. Stem 2-5 cm long, aggregated, appressed to substrate, ovoid, 4-angled, compressed, ridged. Leaf solitary, 1.8-3 × 0.6-0.9 cm, apical from pseudobulb, oblong-ovate, obtuse, petiolate. Inflorescence lateral from pseudobulb, 1 or 3-flowered; peduncle 1.4 cm long, glabrous; pedicellate-ovary 4-5 cm long, slender. Flower 1.8-2.6 cm across, yellow; floral bract lanceolate. Dorsal sepal 0.8-1.1 × 0.5-0.6 cm, oblong-elliptic, obtuse; lateral pair 1.2-1.4 × 0.6-0.8 cm, adnate at base to form a mentum, narrowly ovate-elliptic, obtuse. Petals 1-1.4 × 0.6-0.9 cm, elliptic-ovate to orbicular. Lip 1.6-2.2 × 1.8-2.6 cm, simple, transversely

obcordate, margins erose, hairy centrally. Column 3-5 mm long. Anther yellow; pollinia 2.

Flowering : April – May; Fruiting: May – July.
Specimen cited : Nurserymen's Heaven, Holumba Floral Nursery
980 m, **Rajendra Yonzone, D. Lama and R. B.
Bhujel 1574**, dt. 26. 04. 2011.
Status : Cultivated.
Local distribution : Kaneybreed Floral Nursery - Kalimpong, 850–950m.
General distribution : India (North East India, Sikkim, West Bengal);
Bhutan, China, North Laos, Myanmar, North
Thailand and North Vietnam.

Dendrobium lindleyi Steud., Nomencl. Bot. ed.2: 490. 1840; P.F. Hunt & Summerh., Kew Bull. 20: 55. 1966; Pradhan, Indian Orch. Guide Identif. Cult. 2: 304. 1979; Hedge, Orch. Arun. Pradh. 63. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 305-308. 1998; Bose *et al.* Orch. India. 204. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 404-405. 2002; Lucksom, Orch. Sikkim N.E. Himal. 609. t. 638, pl. 25. 2007; Misra, Orch. India. 293. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Dendrobium aggregatum sensu Roxb., Fl. Ind. ed. 1832: 477. 1832, *non* Kunth 1816; Hook. f., Fl. Brit. India 5: 749. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 60. 1898.

Callista aggregata (Roxb.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Plant epiphytic herb, 5-13 cm tall. Stem 6-7 × 0.6-1.4 cm, ovoid-fusiform, aggregated, yellowish, fibrous-sheathed. Leaf solitary, 2.5-6 × 1.2-2.4 cm, apical from pseudobulb, oblong-elliptic, obtuse-emarginate, jointed, sheathless, petiolate; petiole 0.6-1 cm long. Inflorescence axillary, many-flowered; peduncle 5-8 cm long, glabrous, sheathed; rachis 4-6 cm long, glabrous, 10-21 cm long; pedicellate-ovary 3.5-4 cm long, slender. Flowers 1.5-3 cm across, yellow; floral bracts lanceolate. Sepals subsimilar; dorsal sepal 1-1.2 × 0.6-0.8 cm, ovate, obtuse; lateral pair 1.5-2 × 0.8-0.9 cm wide, adnate at base to form a mentum. Petals 1.1-1.3 × 0.9-1.2 cm, shortly clawed, suborbicular. Lip 1.8-2.3 × 1.8-2.7 cm, yellow, transversely obcordate, glandular-hairy centrally, margins entire to slightly erose, undulate. Column 3-4 mm long with a foot. Anther dome shaped; pollinia 2.

Flowering : February – April; Fruiting: March – May.
Specimen cited : Nurserymen's Heaven, Holumba Floral Nursery
980 m, **Rajendra Yonzone, D. Lama and R. B.
Bhujel 1120**, dt. 05. 04. 2010.
Status : Cultivated.
Local distribution : Kaneybreed Floral Nursery - Kalimpong, 850–950 m.

General distribution : India (Manipur); China, Laos, China, Myanmar, Thailand and Vietnam.

Dendrobium longicornu Lindl., Gen. Sp. Orchid. Pl.: 80. 1830; Hook. f., Fl. Brit. India 5: 720. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 46, t. 64. 1898; Bruhl, Guide Orch. Sikkim. 59. 1926; Tuyama, Hara, Fl. E. Himal. 1: 432. 1966; Tuyama in Hara, Fl. E. Himal. 2: 185. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 328. 1979; Banerji, Orch. Nepal. 63. 1982; Hedge, Orch. Arun. Pradh. 63-64. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 308. 1998; Bose *et al.* Orch. India. 206. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 417-418. 2002; Lucksom, Orch. Sikkim N.E. Himal. 628. t. 668, pl. 28. 2007; Misra, Orch. India. 293. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1541. 2012; *et Ind. Forest.* 140(4): 413-418. 2014.

Dendrobium flexuosum Griff., Not. Pl. Asiat. 3: 317. 1851.

D. hirsutum Griff., Not. Pl. Asiat. 3: 318. 1851; Icon. Pl. Asiat. 3: t. 305. 1851.

D. longicornu var. *hirsuta* (Griff.) Hook. f., Fl. Brit. India 5(2); 720. 1890.

Callista longicornis (Lindl.) Kuntze, Revis. Gen. Pl. 2: 655. 1891.

Dendrobium bulleyi Rolfe, Notes Roy. Bot. Gard. Edinburgh 8: 20. 1913.

Plant epiphytic herb, 16-48 cm tall. Stem erect, sheathed. Leaves 6-14, 3.6-8 × 1.3-2.1 cm, distichous, oblong-lanceolate, subacute, emarginated, sessile. Inflorescence axillary, solitary flowered; peduncle attenuate, sheathed; rachis 1-2 mm; pedicellate-ovary 2.5-3.5 cm, slender. Flower 3.5-4.5 cm across, white; floral bract minute, lanceolate. Sepals subsimilar, ovate-lanceolate, acuminate, keeled; dorsal sepal 1.6-1.9 × 0.7-0.9 cm; lateral pair 3.7-4.7 × 1.1-1.3 cm, adnate to form a long, spur like mentum. Petals 1.7-2 × 0.4-0.5 cm, ovate to ovate-lanceolate, acute, keeled. Lip 2.1-3 × 2.2-2.6 cm, 3-lobed, white with yellow lamellae; side lobes rounded, margins entire to slightly undulate; apical lobe small, suborbicular, fimbriate-lacerate; disc with a broad central ridge. Column 4-5 mm long; foot 1-1.1 cm long. Anthers dome shaped; pollinia 4.

Flowering : August – December; Fruiting: October – January.

Specimen cited : Lava forest 2300 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0151**, dt. 25. 10. 2007.

Status : Sparse.

Local distribution : Lungshel, Gumbadara, Algarah, Mongpoo, Takdah, Dhotrey, Kafer, 1400 – 3000 m.

General distribution : India (Sikkim, West Bengal, Meghalaya, Nagaland); Bhutan, Nepal and Myanmar.

Dendrobium moschatum (Buch.- Ham.) Sw., Schrader, Neu. J. Bot. 1: 94. 1806; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 60, t. 84. 1898; Bruhl, Guide Orch. Sikkim. 64. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 308. 1979; Banerji, Orch. Nepal. 63. 1982; Hedge, Orch. Arun. Pradh. 64. 1984; Deva &

Naithani, Orch. N.W. Himal. 257. t. 258. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 77. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 311. 1998; Bose *et al.* Orch. India. 207. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 412-413. 2002; Lucksom, Orch. Sikkim N.E. Himal. 612-613. t. 643, pl. 26. 2007; Misra, Orch. India. 294. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014; Chowdhery & Agrawala, A Century W.H. Orch. 172. 2013; Misra, Orch. Odisha. 288-289. 2014.

Epidendrum moschatum Buch.-Ham., Symes, Emb. Kingdom Ava: t.26 1800; ed.2(3): 315. 1800.

Cymbidium moschatum (Buch.-Ham.) Willd., Sp. Pl. ed.4(1): 98. 1805.

Dendrobium calceolaria Carey *ex* Hook., Exot. Fl. 3: t. 184. 1826; Hook. f., Fl. Brit. India 5: 744. 1890.

D. cupreum Herbert, Bot. Reg. 21: t. 1779. 1835.

Callista moschata (Buch.-Ham.) Kuntze, Revis. Gen. Pl. 2: 653. 1891.

Plant epiphytic herb, 70-130 cm tall. Stems stout, terete, erect to pendent, ridged, joined; internodes sheathed. Leaves many, 8-16 × 1.1-4.5 cm, elliptic-lanceolate, acute, subsessile, distichous, jointed. Inflorescences lateral, laxly 7 to 15-flowered; peduncle 5-7 cm long, sheathed at base, glabrous; rachis 10-19 cm long, slightly zigzag; pedicellate-ovary 3.5-5 cm long, glabrous. Flowers 5.5-7.5 cm across, yellow; floral bracts oblong-lanceolate. Sepals subequal, ovate-lanceolate to lanceolate, acute to subacute; dorsal sepal 3.8-4.5 × 1.7-2 cm; lateral pair 4.5-5 × 1.7-2 cm, adnate at base to form a mentum. Petals 4.6-5 × 2.8-3.2 cm, ovate-lanceolate, obtuse. Lip 2.6-3.2 × 2.4-2.8 cm, yellow with brown-purple blotches, margin incurved forming a pouch, ciliate veins within. Column 4-7 mm long with a foot. Anther pale-yellow; pollinia yellow.

Flowering : May – July; Fruiting: June – August.

Specimen cited : Relli–Pala near Munthum Busty 800 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0061**, dt. 21. 06. 2007.

Status : Sparse.

Local distribution : Samalbong, Toonang forest, Chisang-Godok, Samsing, Kumsi, Rangit Valley, 500 – 1300 m.

General distribution : India (Assam, Meghalaya, Sikkim); Bhutan, Cambodia, Java, Laos, Malaya, Myanmar, Nepal, Thailand and Vietnam.

Dendrobium nobile Lindl., Gen. Sp. Orchid. Pl.: 24. 1830; Hook. f., Fl. Brit. India 5: 740. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 51, t. 71. 1898; Bruhl, Guide Orch. Sikkim. 65. 1926; Tuyama in Hara, Fl. E. Himal. 1: 432. 1966; Tuyama in Hara, Fl. E. Himal. 2: 185. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 315. 1979; Banerji, Orch. Nepal. 64. 1982; Hedge, Orch. Arun. Pradh. 64. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 78. 1997; Chowdhery, Orch. Fl. Arun. Pradh.

314. 1998; Bose *et al.* Orch. India. 207. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 413. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 160-161. 2005; Lucksom, Orch. Sikkim N.E. Himal. 617-618. t. 649, pl. 27. 2007; Misra, Orch. India. 294. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Dendrobium coerulescens Wall., Lindl., Sert. Orchid. 3: t.18. 1838.

D. lindleyanum Griff., Not. Pl. Asiat. 3: 309. 1851; Icon. Pl. Asiat. 3: t.308. 1851.

D. nobile var. *formosanum* Rchb. f., Gard. Chron. n.s. 19: 432. 1883.

Callista nobilis (Lindl.) Kuntze, Revis. Gen. Pl. 2: 655. 1891.

Dendrobium formosanum (Rchb. f.) Masamune, Trop. Hort. 3: 32. 1933.

D. friedericksianum sensu Brix, Bull. Soc. Roy. Sci. Nat. Laos 5: 8. 1962.

Plant epiphytic herb, 30-55 cm tall. Stems clustered, sheathed. Leaves 5-11, 6.5-11 × 2.3-3 cm, oblong to spatulate, emarginated, sessile, distichous. Inflorescences lateral, 2 to 4-flowered; peduncle 0.8-1.5 cm long, attenuated, bracteate at base; rachis 2-3 cm; pedicellate-ovary 3.5-4.8 cm long, glabrous. Flowers 6-8.1 cm across, whitish-purple; floral bracts scarious, tubular. Sepals oblong-lanceolate, obtuse; dorsal sepal 3.5-4.5 × 1-1.5 cm; lateral pair 3.6-4.6 × 1-1.2 cm, united at base to form a mentum. Petals 3.5-4.2 × 2-2.3 cm, ovate-oblong, obtuse, margins slightly undulate. Lip 3.3-3.7 × 2.6-2.9 cm, simple, central blotch of pale-yellow a white, clawed, convolute at base, ovate-oblong in outline, margins entire. Column 1.1-1.3 cm, foot short. Anther white; pollinia 4.

Flowering : March – June; Fruiting: May – August.

Specimen cited : Rimbick 2200 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0421**, dt. 27. 05. 2008.

Status : Sparse.

Local distribution : 8th Mile Kalimpong, Rimbick, Kumsi, Relli, Sangsay Bhalukhop, Toonang forest, East Main Road, Echey, 300 – 2200 m.

General distribution : India (West Bengal, Assam, Meghalaya); Bhutan, China, Myanmar, Nepal and Thailand.

Dendrobium ochreatum Lindl., Edwards's Bot. Reg. 21: t. 1756. 1835; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 321-322. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 79. 1997; Bose *et al.* Orch. India. 209. 1999; M. Pradhan, 100 N.E. Indian Orch. 124-125. 2006; Misra, Orch. India. 294. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014. *Callista ochreata* (Lindl.) Kuntze, Revis. Gen. Pl. 2: 655. 1891. *Dendrobium cambridgeanum* Paxt., Paxton's Mag. Bot. 6: 265. 1839. [Plate 4.16]

Plant epiphytic herb. Stem 15-33 cm tall, with leaves in 2 ranks along most of their length, decurved, fusiform. Leaves many, 5-12 × 1.8-3.5 cm, ovate-lanceolate, acute.

Inflorescence arises from every node, 1 to 3-flowered; peduncle reduced; pedicellate ovary 4.5-5 cm long, ribbed. Flowers 4-6 cm across, glabrous, yellow; floral bracts membranous. Sepals subequal, broadly oblong-elliptic, acute tip, fleshy, externally keeled, yellow, spreading; dorsal sepal 2.7-3.2 × 1.1- 1.4 cm, concave, nerved; lateral pair 3-3.7 × 1.2-1.5 cm, slightly falcate, base adnate to foot of column, nerved. Petals 2.7-3.2 × 1.1-1.4 cm, orange yellow, elliptic-oblong, tip acute, nerved. Lip 2.5-3.2 cm long, simple, orbicular, hairy with short convolute base and having a dark maroon purple blotch on the yellow lip. Column 5-6 mm long. Anther c. 2 mm long; pollinia 4.

Flowering : May - June; Fruiting: June – August.
 Specimen Cited : Nurserymen’s Heaven, Holumba Floral Nursery
 980 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 9290**, dt. 08. 09. 2009.
 Status : Cultivated.
 Local distribution : Kaneybreed Floral Nursery - Kalimpong, 900–950 m.
 General distribution : India (Khasia hills, Manipur, arunachal Pradesh);
 Burma, Vietnam and Thailand.

Dendrobium pendulum Roxb., Fl. Ind. 3: 482. 1832; Hook., Fl. Brit, India 5: 741. 1890; Hook. f., Fl. Brit. India 5: 741. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 319. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 80. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 316-319. 1998; Bose *et al.* Orch. India. 210. 1999; Lucksom, Orch. Sikkim N.E. Himal. 622. t. 658, pl. 27. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1541. 2012; *et Ind. Forest.* 140(4): 413-418. 2014.

Plant epiphytic herb. Stem 16-38 cm long, nodes swollen, sheathed. Leaves 6-11, 6-14 × 1.3-3 cm, linear-lanceolate, acute. Inflorescence 3-4 cm long, 1-3 flowered; peduncle 1.3-1.7 cm; pedicellate-ovary 3.1-3.6 cm long, ribbed, glabrous, green tinged with purple. Flower 3.6-4.5 cm across, white with apical portion tinged with purple; floral bracts oblong. Sepals spreading, ovate-lanceolate, with apiculate tip, tip tinged with purple, glabrous; dorsal sepal 2-2.4 × 0.8-0.9 cm, oblong-ovate, erect; lateral pair 2-2.5 × 0.9-1 cm, ovate-lanceolate, slightly falcate at base. Petals 1.8-2 × 1.3-1.5 cm, elliptic-ovate, obtuse, minute apiculate tip, white, tip tinged with purple, glabrous. Lip 2.3 × 2 cm, white with a large yellow disc with purple emarginated tip, orbicular-oblong, with short claw, surface hairy, margin ciliolate, tip emarginated. Column 4-4.4 × 3-3.5 mm, white, foot curved. Anther dome shaped; pollinia 4, oblong.

Flowering : March – April; Fruiting: April – June.
 Specimen cited : Nurserymen’s Heaven, Holumba Floral Nursery

980 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1559**, dt. 26. 03. 2011.

Status : Cultivated.
Local distribution : Kaneybreed Floral Nursery - Kalimpong, 850–950 m.
General distribution : India (Manipur); Arracan hills, Myanmar and Thailand.

Dendrobium porphyrochilum Lindl., J. Proc. Linn. Soc., Bot. 3: 18. 1858; Hook. f., Fl. Brit. India 5: 716. 1890; Bruhl, Guide Orch. Sikkim. 55. 1926; Tuyama in Ohashi, Fl. E. Himal. 3: 141. 1975; Pradhan, Indian Orch. Guide Identif. Cult. 2: 339. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 319. 1998; Bose *et al.* Orch. India. 212. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 420-421. 2002; Lucksom, Orch. Sikkim N.E. Himal. 632-633. t. 675, pl. 29. 2007; Misra, Orch. India. 294. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 458. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Callista porphyrochila (Lindl.) Luntze, Revis. Gen. Pl. 2: 654. 1891.

Dendrobium caespitosum King & Pantl., J. Asiat. Soc. Bengal 64(3): 332. 1896. [Plate 4.25. C]

Plant epiphytic herb, 6-11 cm tall. Pseudobulbs cylindric-conical, sheathed. Leaves 2-4, 3-5.6 × 0.6-1 cm, linear-oblong, obliquely emarginated, sessile, jointed. Inflorescence solitary, terminal, longer than the leaves, 6 to 15-flowered; peduncle 1.7-2.9 cm long, slender; rachis 2.7-4.4 cm long, slightly zigzag, glabrous; pedicellate-ovary 5-7.5 mm long, slender, glabrous. Flowers 1-1.2 cm across, greenish-yellow with purple marking; floral bracts linear-lanceolate. Dorsal sepal 0.7-0.9 × 0.1-0.2 cm, spreading, lanceolate, acute; lateral pair 0.8-1 × 0.2-0.3 cm, spreading, linear-lanceolate, acute; mentum short. Petals 0.6-0.7 × 0.2-0.3 cm, oblong-lanceolate, acute. Lip 4-5 × 2.6-3 mm, dark purple with pale-green tip, elliptic-sagittate, subacute, decurved from base, flat, margins entire, slightly undulate, surface glandular-papillose at base; disc 2-keeled. Column 1-2 mm long, broad; foot concave. Anther sub-orbicular; pollinia elongate.

Flowering : May – July; Fruiting: June – August.
Specimen cited : Manaybhanjang 2200 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0475**, dt. 31. 05. 2008.
Status : Rare.
Local distribution : Ramam, Tangta forest, 2000 – 2700 m.
General distribution : India (North East India, Sikkim, West Bengal); China, Myanmar, Nepal and Thailand.

Dendrobium praecinctum Rchb. f., Gard. Chron. n.s. 7: 750. 1877; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Chowdhery, Orch. Fl. Arun. Pradh. 74. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 416. 2002; Lucksom, Orch. Sikkim N.E. Himal. 627. t. 667, pl. 28. 2007; Misra, Orch. India.

294. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Dendrobium pauciflorum King & Pantl., J. Asiat. Soc. Bengal 64(3): 332. 1896; Bruhl, Guide Orch. Sikkim. 60. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 325. 1979; Bose *et al.* Orch. India. 210. 1999.

Callista praecincta (Rchb. f.) Kuntze, Revis. Gen. Pl. 2: 655. 1891.

Dendrobium sikkimense A.D. Hawkes & Heller, Lloydia 20(2); 124. 1957.

Plant epiphytic herb, 31-53 cm tall. Stem pendent, sheathless, narrow, terete, branching from nodes. Leaves 4-9, 3-6.3 × 0.8-1.1 cm, linear-lanceolate, obliquely emarginated, sessile. Inflorescence axillary from leafless stem, 2 to 4-flowered; peduncle slender, sheathed at base; pedicellate-ovary 0.8-1 mm long. Flowers 1-1.2 cm long, purplish-yellow; floral bracts ovate. Dorsal sepal 1-1.3 × 0.5-0.6 cm long, lanceolate-ovate, obtuse; lateral pair 1.7-2 × 0.5-0.8 cm, ovate, slightly falcate, keeled. Petals 1-1.2 × 0.5-0.6 cm, lanceolate-ovate, ciliolate. Lip 0.9-1.6 × 0.4-0.9 cm, 3-lobed, clawed; side lobes narrow, porrect, margins hispid-fimbriate; apical lobe oblong, spotted red, flat, margin hispid-fimbriate; disc thickened, with 3 lines. Column 2-3 mm long, broad, with a foot.

Flowering : June – July; Fruiting: July – August.

Specimen cited : Today forest 1300 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1284**, dt. 30. 06. 2010.

Status : Endangered.

Local distribution : Tangta, 1000 – 1900 m.

General distribution : India (North East India, West Bengal, Sikkim); Bhutan and Thailand.

Dendrobium primulinum Lindl., Gard. Chron. 18: 400. 1858; Hook. f., Fl. Brit. India 5: 735. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 320. 1979; Banerji, Orch. Nepal. 64. 1982; Deva & Naithani, Orch. N.W. Himal. 263-265. t. 262. 1986; Pradhan *et* Pradhan, 100 Beaut. Orch. 81. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 319. 1998; Bose *et al.* Orch. India. 212. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 426. 2002; M. Pradhan, 100 N.E. Indian Orch. 128-129. 2006; Lucksom, Orch. Sikkim N.E. Himal. 623. t. 660, pl. 28. 2007; Misra, Orch. India. 294. 2007; Yonzon *et al.* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014; Chowdhery & Agrawala, A Century W.H. Orch. 174. 2013.

Dendrobium nobile var. *pallidiflorum* Hook., Bot. Mag. 83: t.5003. 1857.

Callista primulina (Lindl.) Kuntze, Revis. Gen. Pl. 2: 655. 1891. [Plate 4.19]

Plant epiphytic herb, 20-55 cm long. Pseudobulb slightly swollen at nodes, sheathed. Leaves many, 8-10 × 2-2.4 cm, oblong-lanceolate, tip lobed. Inflorescence 1 or 2-flowered; pedicellate-ovary 1.8-2.6 cm long, glabrous. Flower 4-4.8 cm across, white suffused with purple; floral bracts oblong. Sepals sub-equal, oblong-obtuse with reticulate venation, glabrous; dorsal sepal 2.5-2.8 × 0.8-0.9 cm, nerved; lateral

pair 2.5-2.8 × 0.7-0.8 cm. Petals 2.4-2.7 × 0.8-0.9 cm, oblong, obtuse or sub-acute, glabrous, white suffused with purple. Lip 2.8-3.2 × 2.5-3 cm, broadly elliptic, obovate, apical half spread emarginated pale prim-rose yellow run with purple streaks, disc with three purple lamellae. Column 4-5 × 2.7-3 mm broad; foot white. Anther conical; pollinia 4.

Flowering : March – April; Fruiting: April – June.
Specimen cited : Nurserymen’s Heaven, Holumba Floral Nursery
980 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1792**, dt. 28. 03. 2012.
Status : Cultivated.
Local distribution : Kaneybreed Floral Nursery – Kalimpong 850–950 m.
General distribution : India (Sikkim, Manipur).

Dendrobium stuposum Lindl., Bot. Reg. 24: misc. 52, no.94. 1838; Hook. f., Fl. Brit. India 5: 186. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 54, t. 75. 1898; Bruhl, Guide Orch. Sikkim. 60. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 324. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 322. 1998; Bose *et al.* Orch. India. 214. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 416-417. 2002; Lucksom, Orch. Sikkim N.E. Himal. 626-627. t. 666, pl. 28. 2007; Misra, Orch. India. 295. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.

Dendrobium shegidoglossum sensu Hook. f., Fl. Brit. India 5(2): 737. 1890, *non* Rchb. f.

Callista stuposa (Lindl.) Kuntze, Revis. Gen. Pl. 2: 654. 1891.

Plant epiphytic herb, 11-30 cm tall. Stems caespitose, subclavate, grooved, yellow, sheathless. Leaves 6-11, 3-7 × 0.6-1.5 cm, oblong, obtuse-emarginate, distichous, sessile. Inflorescence lateral, 2 or 3-flowered; peduncle sheathed; rachis 1-1.1 cm; pedicellate-ovary 0.8-1 cm long, slender. Flowers 1.5-2.1 cm across, white; floral bracts linear-oblong. Dorsal sepal 0.8-1.2 × 0.3-0.4 cm, ovate, acute; lateral pair 1.2-1.4 × 0.4-0.5 cm, ovate, acuminate-aristate, adnate at base to form a mentum. Petals 0.8-1 × 0.4-0.5 cm, oblong-obovate, clawed, obtuse, margins erose-ciliate. Lip 1-1.4 × 0.4-0.8 cm, 3-lobed, blotch of yellow at apex; side lobes long, narrow, triangular, acute; apical lobe ovate-orbicular, apical surface densely glandular-hairy, margins long-ciliate. Column broad, 3-4 mm long with foot. Anther dome shaped; pollinia 4.

Flowering : May – July; Fruiting: June – August.
Specimen cited : Takdah forest 1800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1314**, dt. 10. 07. 2010.
Status : Rare.
Local distribution : Dabaipani, Rambhi forest, 1400 – 2300 m.

General distribution : India (North East India, Sikkim); Bhutan, China, Myanmar and Thailand.

Dendrobium sulcatum Lindl., Bot. Reg. 24: t.65 1838; Hook. f., Fl. Brit. India 5: 749. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 55, t. 78. 1898; Bruhl, Guide Orch. Sikkim. 57. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 304. 1979; Hedge, Orch. Arun. Pradh. 64. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 322. 1998; Bose *et al.* Orch. India. 215. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 405. 2002; Lucksom, Orch. Sikkim N.E. Himal. 609-610. t. 638, pl. 26. 2007; Misra, Orch. India. 295. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.
Callista sulcata (Lindl.) Kuntze, Revis. Gen. Pl. 2: 654. 1891. [Fig. 4.25]

Plant epiphytic herb, 19-38 cm tall. Stem pseudobulbs, clavate, compressed, grooved, narrowed towards base. Leaves 3-4, 8-16 × 3-5 cm, subterminal, distichous, elliptic-ovate, acute, sessile. Inflorescence 6-10 cm long, axillary, adjacent to leaf, subdensely 3 to 6-flowered; peduncle sheathed; rachis 4-6 cm long; pedicellate-ovary 1-1.4 cm long, slender. Flowers 3-4 cm across, yellow; floral bract ovate. Dorsal sepal 2-2.2 × 0.7-0.9 cm, oblong, subacute; lateral pair 2.4-2.6 × 0.7-0.8 cm, adnate at base to form a mentum. Petals 2-2.4 × 1.1-1.2 cm, suborbicular, obtuse, entire. Lip 2.5 × 2.6 cm, red-purple stripes at base, boat shaped, clawed, emarginated, incurved, margin minutely erose. Column 6-7 mm long, broad. Anther cap wide; pollinia pale-yellow.

Flowering : April – June; Fruiting: June – July.

Specimen cited : Kumsi forest 650 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0998**, dt. 26. 10. 2009.

Status : Rare.

Local distribution : Najoke forest, Solok-Kalimpong, Rangit Valley, 550 – 1000 m.

General distribution : India (Sikkim, Meghalaya and Utter Pradesh); Laos, Myanmar and Nepal.

Dendrobium terminale Par. & Rchb. f., Trans. Linn. Soc. London 30: 149. 1874; Hook. f., Fl. Brit. India 5: 725. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 42, t. 55. 1898; Bruhl, Guide Orch. Sikkim. 56. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 343. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 322-327. 1998; Bose *et al.* Orch. India. 215. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 423. 2002; Lucksom, Orch. Sikkim N.E. Himal. 634-635. t. 679, pl. 29. 2007; Misra, Orch. India. 295. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014.
Callista terminalis (Par. & Rchb. f.) Kuntze, Revis. Gen. Pl. 2: 654. 1891. [Fig. 4.26]

Plant epiphytic herb, 9-16 cm tall. Stem subclavate, slender at base, sheathed. Leaves 10-13, 1.2-2 × 0.4-0.6 cm, distichous, fleshy, oblong-elliptic, acute, base broad, sessile. Inflorescence terminal, 1 or 2-flowered; peduncle attenuate, sheathed; pedicellate-ovary 0.6-0.8 cm long, slender. Flowers 1.4-1.6 cm across, white; floral bracts lanceolate. Dorsal sepal 4-6 × 1.5-2.7 mm, lanceolate-elliptic, subacute; lateral pair 5-7 × 7-9 mm, lanceolate-elliptic, subacute, falcate, adnate to form a mentum. Petals 3-6 × 1-1.1 mm, elliptic, obtuse. Lip 7-9 × 4-6 mm, simple, triangular, base narrow, deflexed at the middle, apical margin slightly undulate to minutely erose, slightly 2-lobed. Column 1-1.4 mm long; foot curved. Anther dome shaped; pollinia narrowly oblong.

Flowering : June – September; Fruiting: July – October.

Specimen cited : Lesh khola forest 380 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1325**, dt. 20. 07. 2010.

Status : Rare.

Local distribution : Jaldhaka, Nimbong, 300 – 800 m.

General distribution : India (Sikkim, West Bengal); Bhutan, China, Malaysia, Myanmar and Vietnam.

Dendrobium transparens Wall. ex Lindl., Gen. Sp. Orchid. Pl.: 79. 1830; Hook. f., Fl. Brit. India 5: 738. 1890; Bruhl, Guide Orch. Sikkim. 64. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 316. 1979; Banerji, Orch. Nepal. 65. 1982; Deva & Naithani, Orch. N.W. Himal. 265. t. 264. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 327. 1998; Bose *et al.* Orch. India. 215. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 414. 2002; M. Pradhan, 100 N.E. Indian Orch. 132-133. 2006; Lucksom, Orch. Sikkim N.E. Himal. 618. t. 650, pl. 27. 2007; Misra, Orch. India. 295. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012; *et* Ind. Forest. 140(4): 413-418. 2014; Chowdhery & Agrawala, A Century W.H. Orch. 176. 2013; Misra, Orch. Odisha. 294-295. 2014.

Dendrobium henshalli Rchb. f., Bonplandia 3: 226. 1855.

Callista transparens (Wall. ex Lindl.) Kuntze, Revis. Gen. Pl. 2: 655. 1891.

Plant epiphytic herb, 20-48 cm tall. Stems slender, erect, swollen at nodes, sheathed. Leaves 9-14, 5.5-11.5 × 1.1-1.6 cm, linear-lanceolate, acute to oblique, sessile. Inflorescence lateral, 2 to 4-flowered; peduncle attenuate; pedicellate-ovary 3.1-3.5 cm long, slender. Flowers 4-4.5 cm across, white suffused with pinkish-purple; floral bracts lanceolate. Sepals subequal, lanceolate, acute; dorsal sepal 2.6-2.9 × 0.6-0.9 cm; lateral pair 2.8-3.4 × 0.6-0.8 cm; mentum conical, obtuse. Petals 2.5-3 × 0.8-1.4 cm, ovate, acute. Lip 2.5-3.1 × 1.2-1.8 cm, obscurely 3-lobed, clawed, purple blotches on disc, broadly elliptic-obovate to sagittate; side lobes broad, erose, rolled over the column; apical lobe suborbicular, margins undulate. Column 5-6 mm long, foot short. Anther dome shaped; pollinia yellow.

Flowering : April – May; Fruiting: May – July.

Specimen cited	: Kalijhora forest 500 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0417 , dt. 22. 05. 2008.
Status	: Rare.
Local distribution	: Bagrakot, Mem Tea Estate, Tindharay, Gorubathan, 200 – 1700 m.
General distribution	: India (Sikkim, West Bengal, Assam, Meghalaya, Utter Pradesh); Bhutan, Myanmar and Nepal.

Epigeneium Gagnep.

Plants perennial epiphytic or lithophytic rhizomatous herbs. Pseudobulbs ovoid, sheathed. Leaves 2, arising from pseudobulb tip, oblong to obovate, coriaceous. Inflorescence terminal from pseudobulb, racemes, solitary to several-flowered (inflorescence subtended by a spathaceous bract); floral bracts spathe-like. Flowers long lasting. Dorsal sepal enclosing the column; lateral pair larger than dorsal sepal, oblique, adnate at base to form a mentum. Petals triangular, decurrent on the mentum. Lip pandurate-oblong, simple to 3-lobed; disc with a lobulate or ridged callus on basal part. Column short; foot long; pollinia 4.

The genus *Epigeneium* Gagnep., comprises about 35 species distributed from India, China, South East Asia and Indonesia to the Philippines.

Key to the species

1. Flower small; less than 4 cm across *E. rotundatum*
- 1a. Flower large; more than 7 cm across *E. amplum*

Epigeneium amplum (Lindl.) Summerh., Kew Bull. 12: 260. 1957; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 298. 1979; Banerji, Orch. Nepal. 66. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 334. 1998; Bose *et al.* Orch. India. 226. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 429. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 164-165. 2005; Lucksom, Orch. Sikkim N.E. Himal. 592. t. 604, pl. 25. 2007; Misra, Orch. India. 296. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 459. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1541. 2012.

Dendrobium amplum Lindl., Gen. Sp. Orchid. Pl.: 74. 1830; Bruhl, Guide Orch. Sikkim. 66. 1926.

Sarcopodium amplum (Lindl.) Lindl., Fol. Orchid. Sarcopodium 2: 1, no.1. 1853.

Bulbophyllum amplum (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 244. 1861.

Dendrobium coelogyne Rchb. f., Gard. Chron. 187: 137. 1871.

Sarcopodium coelogyne (Rchb. f.) Rolfe, Orchid Rev. 18: 238. 1910.

Katherinea ampla (Lindl.) A.D. Hawkes, *Lloydia* 19: 95. 1956.

K. coelogyne (Rchb. f.) A.D. Hawkes, *Lloydia* 19: 95. 1956.

Epigenium coelogyne (Rchb. f.) Summerh., *Kew Bull.* 12: 261. 1957. [Fig. 4.27]

Plant epiphytic, rhizomatous herb. Pseudobulbs 3.7-4.7 × 0.5-0.6 cm, ellipsoid, rugose-grooved, sheathed. Leaves 2, 12-18.5 × 4-4.3 cm, broadly elliptic-oblong, obtuse, tip notched, petiolate. Inflorescence solitary flowered; pedicellate-ovary 3.8-5.5 cm long. Flower 7-8 cm across, pale greenish-yellow, spotted with brown; floral bract ovate-oblong. Dorsal sepal 3.9-5.3 × 1-1.2 cm, lanceolate, acute; lateral pair 3.9-4.5 × 1.4-1.6 cm, lanceolate, falcate, acute, saccate at base. Petals 3.7-4.5 × 0.3-0.8 cm, linear-lanceolate, acute. Lip 2.7-4.3 × 1.6-1.7 cm, 3-lobed, dark-purple with bronze edges; side lobes suborbicular; apical lobe rhombic-ovate, recurved at tip, margins crisped; disc 3-lamellate. Column 1.8-2 cm long, curved, winged. Anther dome shaped; pollinia 4.

Flowering	: October – December; Fruiting: November – January.
Specimen cited	: Nim forest 700 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0721 , dt. 22. 10. 2008.
Status	: Frequent.
Local distribution	: Lungshel, Algarah, Sukiapokhari, Ramam, Charkhol, Lloyd Botanical Garden-Darjeeling, 1400 – 2200 m.
General distribution	: India (Sikkim, West Bengal, Meghalaya); Bhutan, Myanmar, Nepal and Thailand.

Epigeneium rotundatum (Lindl.) Summerh., *Kew Bull.* 12: 264. 1957; Hedge, J. *Bombay Nat. Hist. Soc.* 82(1): 118. 1985; Hook. f., *Fl. Brit. India* 5: 857. 1890; Tuyama in Hara, *Fl. E. Himal.* 2: 185-186. 1971; Pradhan, *Indian Orch. Guide Identif. Cult.* 2: 299. 1979; Banerji, *Orch. Nepal.* 66-67. 1982; Chowdhery, *Orch. Fl. Arun. Pradh.* 339. 1998; Bose *et al.* *Orch. India.* 228. 1999; Pearce & Cribb, *Fl. Bhutan*, 3(3): 431-432. 2002; M. Pradhan, *100 Sikkim Himal. Orch.* 166-167. 2005; *et* 100 N.E. *Indian Orch.* 138-139. 2006; Lucksom, *Orch. Sikkim N.E. Himal.* 591. t. 603, pl. 25. 2007; Misra, *Orch. India.* 296. 2007; Yonzone *et al.* *Asian J. Pharm. Lif. Sci.*, 1(4): 459. 2011; *et* *Int. J. Pharm. Life Sci.* 3(3): 1541. 2012.

Sarcopodium rotundatum Lindl., *Fol. Orchid. Sarcopodium* 2: 2, no. 3. 1853.

Bulbophyllum rotundatum (Lindl.) Rchb. f., *Walpers, Ann. Bot. Syst.* 6: 244. 1861.

Dendrobium rotundatum (Lindl.) Hook. f. *Fl. Brit. India* 5(2): 712. 1890; King & Pantl., *Ann. Roy. Bot. Gard. (Calcutta)* 8: 62, t. 87. 1898; Bruhl, *Guide Orch. Sikkim.* 67. 1926.

Katherinea rotundatum (Lindl.) A.D. Hawkes, *Lloydia* 19: 97. 1956. [Plate 4.17]

Plant epiphytic, rhizomatous herb. Pseudobulbs 3.5-4 × 1.5-2 cm, ovoid, sheathed. Leaves 2, 6-9.8 × 1.5-3.2 cm, oblong-elliptic, tip notched, petiolate. Inflorescence solitary-flowered; pedicellate-ovary 3-3.9 cm long. Flower 2-3.5 cm across, green;

floral bract lanceolate. Dorsal sepal 2.4-2.9 × 1-1.3 cm, broadly ovate, fleshy, spreading; lateral pair 2.1-2.7 × 1.2-1.6 cm, falcate, ovate, subacute, adnate on column foot. Petals 2.3-2.7 × 0.7-0.9 cm, oblong, acute, margins slightly undulate. Lip 1.7-2.3 × 1-1.6 cm, 3-lobed, attached at base of column foot; side lobes broadly orbicular; apical lobe slightly 2-lobed, apex emarginated; disc 3-lamellate. Column 0.9-1 × 0.7-0.8 cm, curved, toothed; foot winged. Anther obtusely-ovate; pollinia 4.

Flowering	: September – November & February – March;
Fruiting	: October – December.
Specimen cited	: Lava forest 2100 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0705 , dt. 10. 09. 2008.
Status	: Sparse.
Local distribution	: Lopchu, Nokdara, Algarah, Todey, Toroyok busty, Dilaram, Happy Valley, Senchale, Rambi forest, 1500 – 2600 m.
General distribution	: India (Sikkim); Bhutan.

Flickingeria Hawkes

Plants perennial epiphytic rhizomatous herb. Stem several-nodes, apical node swollen, sheathed, branched. Leaf solitary, coriaceous, erect. Inflorescence several, axillary, terminal or subterminal, solitary flowered. Flowers ephemeral. Sepals subsimilar; lateral pair oblique, adnate at base to form a chin-like mentum with the column foot. Petals narrower than sepals. Lip 3-lobed; hypochile short, concave, with 2 erect side lobes; mesochile oblong, clawed; epichile 2-lobed, transversely oblong to reniform, often pleated or lacerate; callus of 2 or 3 raised, longitudinal lamellae. Column short, fleshy, with a distinct foot; pollinia 4.

The genus *Flickingeria* Hawkes, comprises about 60 species distributed in South East Asia, the Malay Archipelago, the Pacific Islands and North East Australia.

Flickingeria fugax (Rchb. f.) Seidenf., Dansk Bot. Ark. 34(1): 46. 1980; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Deva & Naithani, Orch. N.W. Himal. 281. t. 282. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 399. 1998; Bose *et al.* Orch. India. 255. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 434. 2002; Lucksom, Orch. Sikkim N.E. Himal. 590. t. 602, pl. 25. 2007; Misra, Orch. India. 299. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1542. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 208. 2013.

Dendrobium fugax Rchb. f., Gard. Chron. 1871: 1257. 1871; Hook. f., Fl. Brit. India 5: 752. 1890.

D. sordidum King & Pantl., J. Asiat. Soc. Bengal 66(3): 583. 1897.

Dendrobium macraei auct. non Lindl., 1830; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 61, t.86. 1898; Bruhl, Guide Orch. Sikkim. 66. 1926.

Plant epiphytic herb, 14-28 cm tall. Stems stout, branched, pendent; pseudobulbs 3-6 × 0.7-1 cm, fusiform, compressed, shining, grooved. Leaf solitary, 9-17 × 1.8-2.5 cm, terminal, narrowly oblong, emarginated, sessile. Inflorescences adaxial and abaxial, 1 or 2-flowered; peduncle sheathed; pedicellate-ovary 5-7 mm long, glabrous. Flowers 0.8-1.5 cm across, white; floral bracts minute. Dorsal sepal 0.8-1.2 × 0.4-0.5 cm, elliptic-oblong, subacute, spreading; lateral pair 1-1.3 × 0.3-0.5 cm, elliptic-oblong, subacute, adnate at base to form a mentum. Petals 0.9-1.4 × 0.5-0.6 cm, narrower than the sepals, elliptic-oblong, subacute. Lip 1-1.3 × 0.6-0.9 cm, oblong-obovate, 3-lobed; hypochile wedge-shaped; side lobes erect, oblong; mesochile narrow, margins plicate; epichile oblong-elliptic, apex slightly 2-lobed, margins undulate; disc with 2 lamellae. Column 3-4 mm long; foot medium. Anther white; pollinia 4.

Flowering	: May – July; Fruiting: June – August.
Specimen cited	: Ralli near Pudung Busty 700 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0508 , dt. 21. 06. 2008.
Status	: Sparse.
Local distribution	: Kalijhora, Jholung, Sevoke, Teesta River Valley, Jaldhaka, Sepkhola, Mungpong, 200 – 600 m.
General distribution	: India (North East India, Sikkim, West Bengal).

Subtribe **Bulbophyllinae** Schltr.

Acrochaene Lindl.

Plants perennial epiphytic herbs. Pseudobulbs on rhizome. Leaf solitary, linear-oblong, coriaceous, petiolate. Inflorescence racemes, lax, many-flowered. Flower small, floral bract large and persistent. Sepals subequal, spreading; lateral pair adnate to column foot of the column to form a short mentum. Petals shorter than the sepals, ciliate-fimbriate margins. Lip 3-lobed, shortly clawed, jointed with apex of column foot. Column short; foot long and straight. Anther broad, terminal, 2-celled; pollinia 2.

The genus *Acrochaene* Lindl., is monotypic genus and occurs in North East India and Bhutan.

Acrochaene punctata Lindl., Fol. Orchid. *Acrochaene* 2: 1, no. 1. 1853; Hook. f., Fl. Brit. India 5: 783. 1890; Bruhl, Guide Orch. Sikkim. 99. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 480. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 27. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 43-47. 1998; Bose *et al.* Orch. India. 79.

1999; Pearce & Cribb, Fl. Bhutan, 3(3): 435, t. 436. 2002; M. Pradhan, 100 N.E. Indian Orch. 140-141. 2006; Lucksom, Orch. Sikkim N.E. Himal. 773-774. t. 779, pl. 34. 2007; Misra, Orch. India. 280. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 452. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1536. 2012.

Bulbophyllum kingii Hook. f., Fl. Brit. India 5(2): 760. 1890; Icon. Pl. 21: t. 2053. 1892.

Monomeria punctata (Lindl.) Schltr., Orchideen: 338. 1914. [Plate 4.25. D]

Plant epiphytic, 17-34 cm tall, rhizomatous herb. Pseudobulbs 3.2-4 × 2.5-3 cm, ovoid to globose, rugose. Leaf solitary, 14-30 × 3.4-5.5 cm, oblong-elliptic, tip retuse-emarginate, petiolate. Inflorescence laxly many-flowered; peduncle 4-6 cm long; rachis 12-18 cm long, glabrous; pedicellate-ovary 1.8-2.1 cm long, slender, glabrous. Flowers 1.6-2 cm across, yellowish-green, dotted and streaked with purple brown; floral bracts ovate-lanceolate. Dorsal sepal 0.9-1.2 × 0.5-0.6 cm, elliptic-ovate, acute; lateral pair 0.9-1.3 × 0.6-0.7 cm, broadly triangular, slightly falcate, acute, base adnate to column foot forming a mentum. Petals 0.6-0.8 × 1.6-0.2 cm, lanceolate, acute, margins deeply fimbriate. Lip 1.1 × 1 cm, pale yellow-green, spotted with pink, 3-lobed, shortly clawed, adnate to apex of column foot; side lobes erect, apical margin dentate; apical lobe oblong, deeply grooved centrally, apex obtuse. Column 0.4-0.5 mm long; foot short. Anther ovate; pollinia 2.

Flowering : October – November; Fruiting: November – January.
Specimen cited : Lava forest 1950 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0726**, dt. 23. 10. 2008.
Status : Sparse.
Local distribution : Nokdara, Kafer, Rambi forest, Dowhill, 1200–2200 m.
General distribution : India (Sikkim, West Bengal); Bhutan, Myanmar, Thailand.

Bulbophyllum Thour.

Plant perennial epiphytic or lithophytic herb; rhizome present or absent, sheathed. Pseudobulbs distant or clustered on rhizome. Leaves solitary rarely 2 from pseudobulb apex, thin-textured to coriaceous, erect, suberect. Inflorescence lateral, arising from pseudobulb base, racemose, umbellate, capitate, solitary to many flowered. Flowers minute to large, occasionally showy. Sepals subequal, dorsal sepal free; lateral pair adnate at base to column foot to form a mentum. Petals free, smaller than the dorsal sepal. Lip simple to 3-lobed, sometimes fleshy, mobile, often ciliate or hairy, strongly recurved. Column very short, erect with terminal. Anther not turned away from the rostellum; pollinia 4.

The genus *Bulbophyllum* Thour., comprises about 1000 species widely distributed in the tropical Americas, Africa, Madagascar, the Mascarene Islands, South East Asia to Australia.

Key to the species

1. Pseudobulbs with solitary leaf2
 - 1a. Pseudobulbs with 2 leaves.....34
2. Inflorescence solitary flowered.....3
 - 2a. Inflorescence 2 to many-flowered.....6
3. Rhizome free, pendent.....*B. tortuosum*
 - 3a. Rhizome freeeping.....4
4. Dorsal sepal distinctly shorter than the lateral pair *B. appendiculatum*
 - 4a. Dorsal sepal equaling the lateral pair.....5
5. Pseudobulbs distant along rhizome *B. affine*
 - 5a. Pseudobulbs clustered on rhizome *B. leopardinum*
6. Pseudobulbs very small compared to plant size.....7
 - 6a. Pseudobulbs conspicuous compared to plant size.....11
7. Inflorescence very dense, globose or cylindric, many-flowered.....8
 - 7a. Inflorescence laxly many-flowered, or with only 1 or 2 flowers.....9
8. Inflorescence globose..... *B. gracilipes*
 - 8a. Inflorescence densely cylindric, racemose..... *B. khasyanum*
9. Rachis 2-flowered..... *B. hymenanthum*
 - 9a. Rachis laxly many-flowered.....10
10. Flowers more than 4 mm across;
 - sepals and petals brownish-yellow flushed with green..... *B. rigidum*
 - 10a. Flowers less than 4 mm across; sepals and petals pale green.... *B. apodum*
11. Margins of petals partially or entirely denticulate or ciliate12
 - 11a. Margins of petals glabrous, entire.....18
12. Inflorescence racemose; dorsal sepal equaling lateral pair13
 - 12a. Inflorescence umbellate or subumbillate;
 - dorsal sepal significantly shorter than lateral pair.....15

13. Pseudobulbs more than 2.5 cm tall, cylindrical-ovoid	<i>B. eublepharum</i>	
13a. Pseudobulbs less than 1.8 cm tall, turbinate-discoid or sub-conical		14
14. Inflorescence secund; flowers purple	<i>B. secundum</i>	
14a. Inflorescence not secund; flowers whitish-yellow	<i>B. thomsonii</i>	
15. Dorsal sepal long setose or fimbriate		16
15a. Dorsal sepal shortly papillose, irregularly serrate-erose or entire		17
16. Flowers 1-2.6 cm long	<i>B. helenae</i>	
16a. Flowers 0.8-1.4 cm long	<i>B. roxburghii</i>	
17. Peduncle filiform, more than 2 cm long; flowers upto 1.4 cm long	<i>B. scabratum</i>	
17a. Peduncle stout, less than 1.5 cm long; flowers more than 1.2 cm long	<i>B. yoksunense</i>	
18. Pedicellate ovary with two long prominent filaments	<i>B. bisetum</i>	
18a. Pedicellate ovary lacking filaments		19
19. Lip with auricles at base		20
19a. Lip lacking auricles at base		23
20. Petioles more than 2.5 cm long; inflorescence 2 to 4-flowered	<i>B. striatum</i>	
20a. Petioles less than 2 cm long; inflorescence cylindrical, densely many-flowered		21
21. Inflorescence short	<i>B. crassipes</i>	
21a. Inflorescence long		22
22. Leaf ovate-elliptic, petiole short; petals ovate, aristate, margin minutely setaceous	<i>B. careyanum</i>	
22a. Leaf oblong, petiole upto 1 cm long; petals narrowly triangular with longer aristate tip, margin entire	<i>B. careyanum</i> var. <i>sikkimense</i>	
23. Inflorescence racemose		24
23a. Inflorescence umbel to subumbel		26

24. Inflorescence densely racemose; sepals linear-lanceolate, more than 9 cm long	<i>B. odoratissimum</i> var. <i>racemosum</i>
24a. Inflorescence laxly racemose; sepals ovate-oblong, less than 6.5 mm long	25
25. Pseudobulbs clustered on rhizome; leaf absent during anthesis; lip yellow.....	<i>B. polyrhizum</i>
25a. Pseudobulbs distant on rhizome; leaf present during anthesis; lip yellow with a strong purple margin	<i>B. reptans</i>
26. Lateral pair connivent for at least parts of their length	27
26a. Lateral pair free	28
27. Pseudobulbs less than 5 mm long, compressed	<i>B. sarcophyllum</i>
27a. Pseudobulbs more than 1 cm long, globose-ovoid.....	<i>B. rolfei</i>
28. Dorsal sepal shorter than lateral sepals	29
28a. Dorsal sepal equaling to lateral sepals	30
29. Inflorescence longer than leaves; flowers spotted with purple.....	<i>B. guttulatum</i>
29a. Inflorescence shorter than leaves; flowers not spotted with purple.....	<i>B. umbellatum</i>
30. Petals solitary-nerved	31
30a. Petals 3-nerved	32
31. Inflorescence a dense, many-flowered head	<i>B. odoratissimum</i> var. <i>odoratissimum</i>
31a. Inflorescence laxly 2 to 4-flowered	<i>B. gamblei</i>
32. Pseudobulbs cylindrical to ellipsoid, more than 2 cm long	33
32a. Pseudobulbs ovoid-globose, less than 2 cm long	<i>B. stenobulbon</i>
33. Flower more than 1 cm across; pedicellate ovary upto 5.5 mm long	<i>B. cauliflorum</i>
33a. Flower less than 1 cm across; pedicellate ovary upto 3.7 mm long	<i>B. cauliflorum</i> var. <i>sikkimense</i>
34. Leaves absent during anthesis.....	35

34a. Leaves present or absent during anthesis *B. hirtum*

35. Inflorescence 28-40-flowered; flowers less than 1 cm long *B. triste*

35a. Inflorescence 5-10-flowered; flowers more than 2 cm long.... *B. wallichii*

Bulbophyllum affine Lindl., Gen. Sp. Orchid. Pl.: 48. 1830; Hook. f., Fl. Brit. India 5: 756. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 67, t.91. 1898; Bruhl, Guide Orch. Sikkim. 206. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 379. 1979; Banerji, Orch. Nepal. 89. 1982; Deva & Naithani, Orch. N.W. Himal. 201. t. 202. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 87. 1998; Bose *et al.* Orch. India. 106. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 441. 2002; Lucksom, Orch. Sikkim N.E. Himal. 690. t. 728, pl. 30. 2007; Misra, Orch. India. 282. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* McAllen Int. Orch. Soc. J. 13(10): 9. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 100. 2013.

Sarcopodium affine (Lindl.) Lindl., Paxton's Fl. Gard. 1: 155. 1850.

Phyllorchis affinis (Lindl.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

Plant epiphytic herb, 11-22 cm tall. Pseudobulbs 2.5-4 × 0.3-0.6 cm, distant along rhizome. Leaf solitary, 9-18 × 2.4-3.3 cm, coriaceous, oblong-lanceolate, tip 2-lobed, petiolate. Inflorescence basal, very short, solitary-flowered; peduncle slender, sheathed; pedicellate-ovary 6.8-8 cm long, slender-filiform. Flower 2.5-2.9 cm across, pale green with purple nerves; floral bract lanceolate. Dorsal sepal 1.7-2 × 0.5-0.6 cm, linear-lanceolate, acuminate, slightly concave; lateral pair 1.8-2.1 × 0.6-0.7 cm, obliquely triangular-lanceolate, weakly falcate. Petals 1.4-1.7 × 0.3-0.4 cm, linear-lanceolate, acuminate. Lip 0.8-1.2 cm long, simple, yellow with purple margins, fleshy, adnate to base of column foot, ovate, acute. Column fleshy, yellowish-green; foot slightly curved. Anther conical, yellow; pollinia 4, oblong.

Flowering : May – June; Fruiting: June – October.
Specimen cited : Samalbong Busty 830 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0066**, dt. 21. 06. 2007.
Status : Common.
Local distribution : Samthar, Mungpoo, Nimbong, Bong Busty, Pedong, Seokbir khani, 700 – 1800 m.
General distribution : India, (Eastern and Western Himalayas); Bhutan, Cambodia, China, Japan, Laos, Nepal, Vietnam.

Bulbophyllum apodum Hook. f., Fl. Brit. India 5(2): 766. 1890; Icon. Pl. ser.4, 21: t. 2043. 1892; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pearce & Cribb, Fl. Bhutan, 3(3): 461. 2002; Lucksom, Orch. Sikkim N.E. Himal. 713-714. t. 766. 2007; Misra, Orch. India. 282. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 9. 2012.

Phyllorchis apoda (Hook. f.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

Bulbophyllum ebulbum King & Pantl., J. Asiat. Soc. Bengal 64(3): 334. 1896 et Ann. Roy. Bot. Gard. (Calcutta) 8: 83, t. 115. 1898; Bruhl, Guide Orch. Sikkim. 198. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 428. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 104. 1998; Bose *et al.* Orch. India. 112. 1999.

Plant epiphytic herb, 16-23 cm tall, rhizomatous. Pseudobulb absent. Leaf solitary, 14-22 × 2.8-4 cm, oblong-lanceolate, obtuse to subacute, petiolate. Inflorescence basal, close to leaf, racemes, laxly many-flowered; peduncle 3.5-4.5 cm long, sheathed at base; rachis 9-15.5 cm long, slender, glabrous; pedicellate-ovary 2.6-3.5 mm long. Flowers 3-4 mm long, pale green; floral bracts lanceolate. Dorsal sepal 4-5 × 1.3-1.7 mm, oblong-lanceolate, acute, hooded; lateral pair 5-6.8 × 1.2-2.4 mm, lanceolate, falcate, acuminate, base adnate with column foot; mentum short. Petals 2.3-2.9 × 0.8-1 mm, linear-oblong, obtuse. Lip 2.8-3.3 × 1-1.2 mm, obscurely 3-lobed, decurved, subacute, margins entire, base subauriculate to puriform, folded upwards to form a central groove. Column 0.8-1 mm, stout; foot curved. Anther ovate; pollinia elliptic.

Flowering : May – July; Fruiting: June – August.

Specimen cited : Teesta River sides near Seti Bridge 460 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1334**, dt. 13. 07. 2010.

Status : Threatened.

Local distribution : Malli, Solok, 300 – 600 m.

General distribution : India (Sikkim, Darjeeling foot hills).

Bulbophyllum appendiculatum (Rolfe) J.J. Sm., Bull. Jard. Bot. Buitenzorg ser.2, 8: 22. 1912; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pearce & Cribb, Fl. Bhutan, 3(3): 467. 2002; M. Pradhan, 100 N.E. Indian Orch. 142-143. 2006; Yonzone *et al.* McAllen Int. Orch. Soc. J. 13(10): 9. 2012.

Cirrhopetalum appendiculatum Rolfe, Bull. Misc. Inform. Kew 1901: 148. 1901.

C. ornatissimum sensu Hook. f., Fl. Brit. India 5(2): 773. 1890., *non* Rchb. f.; Bruhl, Guide Orch. Sikkim. 70. 1926; Pradhan & Pradhan, 100 Beaut. Orch. 40. 1997.

Mastigion appendiculatum (Rolfe) Garay, Hamer & Seigrist, Nordic J. Bot. 14: 637. 1994; Lucksom, Orch. Sikkim N.E. Himal. 682. t. 718, pl. 29. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1545. 2012; Misra, Orch. Odisha. 302-303. 2014.

Plant epiphytic, 6-11 cm tall, rhizomatous herb. Pseudobulb 2.2-2.9 × 0.8-1 cm, cylindrical to ellipsoid, ribbed. Leaf solitary, 4.2-7 × 1.9-2.6 cm, oblong-elliptic, emarginated, petiolate. Inflorescence erect, basal, solitary-flowered; peduncle 6-8 cm long, sheathed; pedicellate-ovary 1.7-1.9 cm long. Flower 10-14 cm long, pale-green, shaded with dark purple streaks; floral bract lanceolate. Dorsal sepal 1.7-2 × 0.7-0.9 cm, shorter than the lateral pair, ovate, caudate, margins pilose-setiform;

lateral pair 11-16 × 0.7-0.9 cm, free at base, attached to base of column foot, twisted, lanceolate, apices free, caudate-filiform. Petals 1.2-1.6 × 0.2-0.3 cm, linear-oblong, falcate, acuminate, margins setose. Lip 0.9-1.2 × 0.5-0.7 cm, adnate to apex of column foot, pinkish-purple, fleshy, glabrous, ovate-oblong, obtuse, margins erect, base concave; disc 3-keeled, glabrous. Column 3-4 × 2-2.5 mm, stout, foot curved. Anther dome shaped; pollinia oblong.

Flowering : October – December; Fruiting: December – February.
Specimen cited : Najoke forest 430 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1508**, dt. 08. 09. 2009.
Status : Endangered.
Local distribution : Latpanjar, Lesh khola, Kumsi, 300 – 1200 m.
General distribution : India (Assam, Madhya Pradesh, Nagaland);
Bhutan, Laos and Vietnam.

Bulbophyllum bisetum Lindl., Ann. Mag. Nat. Hist. 10: 186. 1842; Hook. f., Fl. Brit. India 5: 767. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 73, t. 99. 1898; Bruhl, Guide Orch. Sikkim. 203. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 426-427. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 92. 1998; Bose *et al.* Orch. India. 108. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 450. 2002; M. Pradhan, 100 N.E. Indian Orch. 144-145. 2006; Lucksom, Orch. Sikkim N.E. Himal. 692. t. 731, pl. 30. 2007; Misra, Orch. India. 282. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 9. 2012.

Bulbophyllum cirrhopetaloides Griff., Not. Pl. Asiat. 3: 290. 1851.

Phyllorchis biseta (Lindl.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

Plant epiphytic, rhizomatous herb, 6-11 cm tall. Pseudobubs 1.5-2.4 × 1-1.4 cm, ovoid or conical to flask-shaped, fibrous sheathed. Leaf solitary, 4.5-9 × 1.2-1.9 cm, oblong-lanceolate, acuminate, obliquely 2-lobed, petiolate. Inflorescence pendent, racemes, 9 to 16-flowered; peduncle 3.4-6.5 cm long; rachis 2-4 cm long; pedicellate-ovary with two long prominent filaments. Flowers 0.5-0.7 cm across, whitish-purple; floral bracts ovate. Dorsal sepal 5-6 × 1.2-1.6 mm, ovate-lanceolate, acute, keeled, margins undulate; lateral pair 5-6.2 × 1.5-2 mm, lanceolate, curved and acuminate, unequal, base connivent for about half length, outer margins undulate. Petals 3.6-4 × 1.1-1.3 mm, spatulate, clawed, acute. Lip 4-5.5 × 5-6 mm, white suffuse with purple, ovate-lanceolate, stipitate, deflexed centrally; hypochile with 2 crenate ridges; epichile hairy. Column 1.4-1.6 mm long; foot curved. Anther apiculate; pollinia elliptic.

Flowering : September – October; Fruiting: October – December.
Specimen cited : Kafer forest 1960 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0958**, dt. 21. 09. 2009.

Status : Common.
 Local distribution : Samalbong, Hill Top, Takdah, Tangta forest,
 Toroyok, 1200 – 2000 m.
 General distribution : India (Sikkim, Darjeeling hills, Meghalaya).

Bulbophyllum careyanum (Hook.) Spreng., Syst. Veg. ed. 16(3): 732 1826; Hook. f., Fl. Brit. India 5: 760. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 71, t. 97. 1898; Bruhl, Guide Orch. Sikkim. 206. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 398. 1979; Banerji, Orch. Nepal. 90. 1982; Deva & Naithani, Orch. N.W. Himal. 201 – 205. t. 203. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 95. 1998; Bose *et al.* Orch. India. 110. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 451. 2002; Lucksom, Orch. Sikkim N.E. Himal. 699. t. 743, pl. 31. 2007; Misra, Orch. India. 282. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 9. 2012.

Anisopetalon careyanum Hook., Exot. Fl. 2: t.149. 1825.

Pleurothallis purpurea D. Don, Prod. Fl. Nepal.: 33. 1825.

Tribrachia purpurea (D. Don) Lindl., Coll. Bot.: *sub* t.41A. 1826.

Bulbophyllum cupreum sensu Hook., Bot. Mag. 88: t.5316. 1862, non Lindl.

B. careyanum var. *ochraceum* Hook. f., Fl. Brit. India 5(2): 760. 1890.

Phyllorchis purpurea (D. Don) Kuntze, Revis. Gen. Pl. 2: 676. 1891.

Plant epiphytic, 14-30 cm tall, rhizomatous herb. Pseudobulbs 3-6 × 2.8-3.4 cm, globose-ovoid, lightly grooved. Leaf solitary, 11-23 × 3.6-4.9 cm, ovate-elliptic, obtuse, petiolate. Inflorescence lateral from pseudobulb base, decurved, racemes, cylindric, densely many-flowered; peduncle 5.4-7.7 cm long, stout; rachis 4.6-7.3 cm, glabrous; pedicellate-ovary 4 mm long, stout. Flowers 7-8 mm long, purplish-brown; floral bracts ovate-lanceolate. Dorsal sepal 4.9-5.8 × 2.5-2.8 mm, oblong-ovate, acute; lateral pair 6.9-7.6 × 3.6-4 mm, oblong-ovate, acute. Petals 2.6-3 × 1-1.2 mm, broadly ovate, aristate, margins minutely setaceous. Lip 3.6-4.6 × 1.8-2.1 mm, simple, yellow blotched with violet, auriculate at base, subentire, shortly stipitate, recurved. Column 2-2.8 mm tall, stout. Anther triangular; pollinia 2.

Flowering : October – January; Fruiting: December – February.
 Specimen cited : Suruk Busty 750 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1507**, dt. 25. 10. 2010.
 Status : Sparse.
 Local distribution : Samthar, Godok, Todey, Latpanjar, Tungsong, Mirik, 700 – 1650 m.
 General distribution : India (Arunachal Pradesh, Meghalaya, Sikkim, West Bengal, Utter Pradesh); Bhutan, Myanmar, Nepal, Thailand.

Bulbophyllum careyanum (Hook.) Spreng. var. *sikkimense* Lucksom, Orchids Sikkim and N.E. Himal. 700-701, t. 744, pl. 31). 2007; Misra, Orch. India. 282. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 10. 2012.

Plant epiphytic herb, 14-22 cm tall. Pseudobulb 2.6-3.4 × 3.1-3.5 cm, erect, narrowly ovoid, sheathed. Leaf solitary, 12-17 × 2.5-3.2 cm, oblong, sub-acute, notched, petiolate. Inflorescence 10.6-13 cm long, arising from the base of pseudobulb; peduncle 6.4-7.3 cm long; rachis 4.9-6.8 cm long, densely flowered; pedicellate-ovary 4-4.6 × 1.3-1.6 mm long, ribbed, smooth. Flowers 6.9-7.4 mm long, dark purple; floral bracts lanceolate. Sepals subequal, pale-green, externally warty but internally glabrous; dorsal sepal 4-5.1 × 2.7-3.1 mm, oblong-ovate, acute; lateral pair 6.3-6.5 × 3.2-3.7 mm, acute, ovate-lanceolate. Petals 3-3.8 × 0.9-1.1 mm, narrowly triangular, oblique at base, aristate, margin entire. Lip 3.5-3.8 × 1.8-2 mm, movable, dark violet, narrowly oblong-ovate, sub-acute, with a broad base and two short falcate side lobes; apical lobe oblong-ovate, edges densely ciliolate, with a median groove. Column 2.8-3.1 × 1.2-1.4 mm long, erect, stout, glabrous, yellow, with two apical, oblong, acute. Anther triangular; pollinia 2.

Flowering : October – November; Fruiting: November – January.
 Specimen cited : Samalbung Busty 1200 m, **Rajendra Yonzon,**
D. Lama and R. B. Bhujel 0168, dt. 26. 10. 2007.
 Status : Sparse.
 Local distribution : Soreksa, Mangzing, Kuwapani-Lava, Echey
 Busty, 800 – 2100 m.
 General distribution : India (Arunachal Pradesh, Meghalaya, Sikkim,
 West Bengal, Utter Pradesh); Bhutan, Myanmar,
 Nepal, Thailand.

Bulbophyllum cauliflorum Hook. f., Fl. Brit. India 5(2): 758. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 80, t. 100. 1898; Bruhl, Guide Orch. Sikkim. 206. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 412. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 99. 1998; Bose *et al.* Orch. India. 110. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 444. 2002; M. Pradhan, 100 N.E. Indian Orch. 146-147. 2006; Lucksom, Orch. Sikkim N.E. Himal. 697. t. 738, pl. 31. 2007; Misra, Orch. India. 282. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J. 13(10): 10. 2012.

Plant epiphytic, 6-14 cm tall, rhizomatous herb. Pseudobulb 2.3-4.2 × 0.6-0.9 cm, sub-cylindric, smooth, ribbed, sheathed. Leaf solitary, 3.6-9 × 1.5-2.8 cm, oblong to linear oblong, obtuse, notched at the tip, petiolate. Inflorescence sub-umbel, erect, either from the base of pseudobulb or from the rhizome; peduncle 0.9-2.8 cm long, erect; rachis 2-3 mm long, with 4-6 pedicellate flowers; pedicellate-ovary 3.2-5.5 mm long, terete. Flowers 1-1.3 cm long, greenish-yellow; floral bracts lanceolate.

Sepals sub-equal, linear-lanceolate, caudate-acuminate, apices hooked; dorsal sepal 8-10 × 1.9-2 mm; lateral pair 9-1.1 × 2-2.3 mm. Petals 5-6 × 1.1-1.3 mm, lanceolate, acuminate. Lip 2-2.3 × 7-9 mm, lanceolate, deflexed below the middle, apex obtuse, base truncate and joined on to the tip of short curved foot, whitish yellow. Column 2-2.3 mm long. Anther cordate; pollinia orbicular-oblong.

Flowering : April – July; Fruiting: June – August.
Specimen cited : Algarah forest 1800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1176**, dt. 20. 05. 2010.
Status : Sparse.
Local distribution : Sukiapokhari, Rimbick, Kafer, Rambi forest, 1600–2200 m.
General distribution : India (Sikkim, Darjeeling, Meghalaya).

Bulbophyllum cauliflorum Hook. var. *sikkimense* Pearce & Cribb, Edinb. J. Bot. 58(1): 108. 2001; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pearce & Cribb, Fl. Bhutan, 3(3): 445, t. 446. 2002; Lucksom, Orch. Sikkim N.E. Himal. 697. t. 739, pl. 31. 2007; Misra, Orch. India. 282. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J. 13(10): 10. 2012.

Plant epiphytic, 7-14 cm tall, rhizomatous herb. Pseudobulbs 2-4 × 0.4-0.6 cm, cylindric to ellipsoid, slightly dilated towards base. Leaf solitary, 5.5-9.3 × 1.5-2.9 cm, oblong-elliptic, obtuse, petiolate. Inflorescence base from pseudobulb and along rhizome, 4 or 5-flowered; peduncle 2.5-3.5 cm long, slender, sheathed; rachis 2-5 mm long, slender; pedicellate-ovary 2.8-3.7 mm long. Flowers 0.6-1.1 cm across, green flushed with brown (tip of sepals yellow; floral bracts linear-lanceolate. Dorsal sepal 5-7 × 0.4-0.7 mm, linear-lanceolate, acuminate, margins entire; lateral pair 5-8 × 0.5-0.8 mm, slightly falcate. Petals 2.2-3 × 0.4-0.5 mm, narrowly lanceolate, acuminate, transparent. Lip 1.2-1.5 × 0.6-0.8 mm, simple, green-brown, lanceolate, base truncate, deflexed below the centre, subacute, channeled from base to near apex, margins entire, attached to column foot. Column 0.5 mm tall, broad; foot curved. Anther yellow; pollinia yellow.

Flowering : June – August; Fruiting: July – September.
Specimen cited : Nokhdara Busty 1930 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 9290**, dt. 28. 07. 2008.
Status : Frequent.
Local distribution : Lava, Algarah, Rambi forest, Munsong, 650–2200 m.
General distribution : India (Sikkim, West Bengal).

Bulbophyllum crassipes Hook. f., Fl. Brit. India 5(2): 760. 1890; Seidenf., Dansk. Bot. Arkiv 33(3): 129. F. 86. 1979; Rao, Arunachal Forest News 12(1): 25-26. 1994; Chowdhery, Orch. Fl. Arun. Pradh. 99-101. 1998; Bose *et al.* Orch. India. 112. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 451. 2002; M. Pradhan, 100 N.E. Indian Orch. 148-149. 2006; Lucksom, Orch. Sikkim N.E. Himal. 701. t. 745. 2007; Misra, Orch. India. 282. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1537. 2012; *et McAllen Int. Orch. Soc. J.* 13(10): 10. 2012; Misra, Orch. Odisha. 310-311. 2014.

Bulbophyllum careyanum sensu Hook., Bot. Mag. 71: t.4166. 1845, *non* (Hook.) Spreng; Hedge & A.N. Rao, Arunachal Forest News 7(1-2):58. 1989.

Phyllorchis crassipes (Hook. f.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

Bulbophyllum careyanum var. *crassipes* (Hook. f.) Pradhan, Indian Orch.: Guide Identify. Cult. 2: 713. 1979.

Plant epiphytic, 11-22 cm tall, rhizomatous herb. Pseudobulbs 4-4.7 × 3.5-3.9 cm, conical, sheathed. Leaf solitary, 7-16 × 2.5-4.2 cm, oblong, obtuse to mucronate, coriaceous, petiolate. Inflorescence lateral from pseudobulb base, racemes, stout, densely many-flowered; peduncle thick, short; rachis 4-5.6 cm long; pedicellate-ovary 0.3-0.4 cm long. Flowers 7-8 mm long; sepals greenish to yellow, spotted with purple, petals whitish with purple markings; floral bracts oblong. Dorsal sepal 4-5.2 × 2.8-3.2 mm, obovate to elliptic, acute; lateral pair 5.5-8 × 3-4 mm, ovate, acuminate, oblique, margins glabrous. Petals 2.5-4 × 0.5-1 mm, narrowly elliptic, acute to aristate. Lip 2.5-3.3 × 2-2.4 mm, simple to obscurely 3-lobed, golden yellow suffused with purplish-red, oblong, margins entire. Column 2.7-3.2 mm tall; steldia short, triangular.

Flowering	: September – October; Fruiting: October – December.
Specimen cited	: Mungpoo 890 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0102 , dt. 05. 09. 2007.
Status	: Frequent.
Local distribution	: Suruk, Samalbong, Rambhi, Tindharay, Seokbir khani, Gorubathan, Dudhay, Khaprail, Lohapul, Matigara, 200 – 1000 m.
General distribution	: India, (North East India, Sikkim, West Bengal); Malaysia, Myanmar and Thailand.

Bulbophyllum eublepharum Rchb. f., Walpers, Ann. Bot. Syst. 6: 252. 1861; Hook. f., Fl. Brit. India 5: 764. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 78, t. 107. 1898; Bruhl, Guide Orch. Sikkim. 201. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 400. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 108. 1998; Bose *et al.* Orch. India. 114. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 455. 2002; Lucksom, Orch. Sikkim N.E. Himal. 704-705. t. 750, pl. 32. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1537. 2012; *et McAllen Int. Orch. Soc. J.* 13(10): 10. 2012.

Phyllorchis eublepharum (Rchb. f.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

Plant epiphytic herb, 15-28 cm tall. Pseudobulbs 6-7 × 1.2-1.4 cm, clustered, cylindrical-ovoid, sheathed. Leaf solitary, 11-17 × 2.9-3.6 cm, oblong-elliptic, acute, petiolate. Inflorescence 18-26 cm long, basal from pseudobulb, tall, slender, racemes, laxly 22 to 30-flowered; peduncle 15-22 cm long, glabrous, sheathed; rachis 4.3-6.5 cm long, glabrous; pedicellate-ovary glabrous. Flowers 1-1.3 cm across, green; floral bracts linear-lanceolate. Dorsal sepal 6-7 × 2.3-2.8 mm, ovate-lanceolate, acuminate, concave; lateral pair 7-8 × 1.5-2.2 mm, ovate-lanceolate, acuminate, spreading. Petals 3.6-4 × 1.6-2 mm, ovate-elliptic, subacute, margins serrate-fimbriate. Lip 2-3 × 1.3-1.8 mm, simple, dark purple, attached to the column foot, thick, oblong-lanceolate, apex obtuse, emarginated, upper surface grooved, apical margins ciliate. Column 1.6 mm long, broad; foot curved. Anther hooded; pollinia oblong.

Flowering : May – August; Fruiting: July – September.

Specimen cited : Sonada 2050 m, **Rajendra Yonzone, D. Lama and R.B. Bhujel 1226**, dt. 10. 06. 2010

Status : Rare.

Local distribution : Neora Valley, Senchale, Rambi forest, 1400–2500 m.

General distribution : India (Sikkim).

Bulbophyllum gamblei (Hook. f.) Hook. f., Fl. Brit. India 6(1): 188. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 82, t. 113. 1898; Bruhl, Guide Orch. Sikkim. 204. 1926; Tuyama in Hara, Fl. E. Himal. 1: 426. 1966; Tuyama in Hara, Fl. E. Himal. 2: 177. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 409. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 108. 1998; Bose *et al.* Orch. India. 114. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 445. 2002; Lucksom, Orch. Sikkim N.E. Himal. 698. t. 740, pl. 31. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 10. 2012.

Bulbophyllum leptanthum var. *gamblei* Hook. f., Fl. Brit. India 5(2): 759. 1890.

Phyllorchis gamblei (Hook. f.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

Plant epiphytic, 3-6 cm tall, rhizomatous herb. Pseudobulbs 1-1.6 × 0.4-0.6 cm, narrowly subcylindric. Leaf solitary, 2.5-4.2 × 0.7-0.9 cm, oblong-lanceolate, obtuse, petiolate. Inflorescence erect, umbel, 2 to 4-flowered; peduncle 2-3 cm long, filiform; pedicellate-ovary 2-4 mm long, slender. Flowers 1-1.2 cm across, pale yellowish-green; floral bracts ovate. Dorsal sepal 7-9 × 1.5-2 mm, lanceolate, acuminate; lateral pair 7-9 × 1.8-2.5 mm, lanceolate, subacute, widened at base. Petals 4-6 × 1.7-2 mm, lanceolate, acuminate. Lip 2.5-4 × 1.6-2 mm, simple, adnate to column foot, oblong-lanceolate, subacute, base cordate, grooved centrally, slightly recurved. Column 1-1.4 mm long, broad; stelidia triangular-acuminate; foot curved. Anther ovate; pollinia elliptic-oblong.

Flowering : May – August; Fruiting: July – September.
 Specimen cited : Takdah forest 1670 m, **Rajendra Yonzone, D. Lama and R.B. Bhujel 1171**, dt. 20. 05. 2010.
 Status : Common.
 Local distribution : Ramam forest, Algarah, Manaybhanjang, Baggonra, 1400 – 2700 m.
 General distribution : India (North East India, Sikkim, West Bengal); Bhutan.

Bulbophyllum gracilipes King & Pantl., J. Asiat. Soc. Bengal 65(2): 119. 1896; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 198. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 425. 1979; Pearce & Cribb, Fl. Bhutan, 3(3): 459. 2002; Lucksom, Orch. Sikkim N.E. Himal. 713. t. 765. 2007; Misra, Orch. India. 283. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 10. 2012.

Plant epiphytic herb, 3.5-6 cm tall. Pseudobulbs absent. Leaf solitary, 3.4-5.6 × 1.3-2.4 cm, coriaceous, elliptic-oblongate, obtuse, tip minutely bifid, petiolate. Inflorescence 3-6 cm long, erect, capitate-globose, densely 8 to 12-flowered; peduncle 2-6 mm long, filiform; pedicellate-ovary 1-1.5 mm long. Flowers 2.6-3.5 mm across, fleshy, dull purple; floral bracts ovate. Dorsal sepal 2.3-2.6 × 1.4-1.7 mm, triangular, narrowed to subacute apex, close to column; lateral pair 2.2-2.4 × 1.7-1.9 mm, ovate, acute. Petals 1.9-2.1 × 1.2-1.7 mm, oblong, falcate, acute. Lip 1.3-1.5 × 0.9-1 mm, obovate, swollen, decurved from the middle, surface papillose; tip convex, dilated, margins entire, broad, base deeply grooved. Column 0.8-1 mm long, erect, apices pointed, with a short foot. Anther depressed; pollinia 4.

Flowering : October – December; Fruiting: December – January.
 Specimen cited : Nimbong forest 890 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1158**, dt. 02. 05. 2010.
 Status : Rare.
 Local distribution : Bagrakot, Tindheray, Sepkhola, Guling forest, Rangit Valley, 300 – 950 m.
 General distribution : India (Darjeeling district and lower valley of Sikkim).

Bulbophyllum guttulatum (Hook. f.) N.P. Balakr., J. Bombay Nat. Hist. Soc. 67:66. 1970; Hook. f., Fl. Brit. India 5: 776. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 413. 1979; Hedge, Orch. Arun. Pradh. 58. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 111. 1998; Bose *et al.* Orch. India. 116. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 472. 2002; Lucksom, Orch. Sikkim N.E. Himal. 708. t. 756, pl. 32. 2007; Misra, Orch. India. 283. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453.

2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 10. 2012; Misra, Orch. Odisha. 314-315. 2014.

Bulbophyllum umbellatum sensu Lindl., Bot. Reg. 31: t.44. 1845.

Cirrhopetalum guttulatum Hook. f., Fl. Brit. India 5(2): 776. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 94, t. 131. 1898; Bruhl, Guide Orch. Sikkim. 69. 1926; Banerji, Orch. Nepal. 100. 1982. [Plate 4.26. A]

Plant epiphytic, 13-30 cm tall, rhizomatous herb. Pseudobulbs 3-6 × 1.5-2.2 cm, conical-ovoid, erect. Leaf solitary, 8-19 × 2.8-4.2 cm, oblong-elliptic, obtuse, minutely retuse, petiolate. Inflorescence 19-28 cm long, longer than the leaves, basal from pseudobulb, umbel, 6 to 9-flowered; exceeding leaf, slender, sheathed, glabrous; peduncle 9-23 cm long, erect, smooth; pedicellate-ovary 2-2.8 cm long, slender. Flowers 1.4-1.8 cm long, pale-yellow with purple spots; floral bracts lanceolate. Dorsal sepal 0.8-1 × 0.7-0.8 cm, ovate, obtuse; lateral pair 1.3-1.5 × 0.7-0.8 cm, ovate-lanceolate, broadly based, acute, free, adnate to column foot. Petals 0.5-0.6 × 0.2-0.3 cm, ovate. Lip 3-4 × 2.5-4 mm, simple, fleshy, oblong, deflexed centrally, base broad. Column 1.5-1.8 × 1.4-1.6 mm, broad, staked. Anther ovoid; pollinia 4.

Flowering : July – September; Fruiting: August – October.
Specimen cited : Sittong 970 m, **Rajendra Yonzone, D. Lama and R.B. Bhujel 1457**, dt. 31. 08. 2010.
Status : Rare.
Local distribution : Mungpoo, Godok, Samalbong, Takdah, Godok, 650 – 1800 m.
General distribution : India (North East India, Sikkim, West Bengal, Utter Pradesh); Bhutan, Nepal.

Bulbophyllum helenae (Kuntze) J.J. Sm., Bull. Jard. Bot. Buitenzorg 2(8): 24. 1912; Pradhan, Indian Orch. Guide Identif. Cult. 2: 389. 1979; Deva & Naithani, Orch. N.W. Himal. 205. t. 206. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 37. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 115. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 468. 2002; M. Pradhan, 100 N.E. Indian Orch. 152-153. 2006; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 10. 2012.

Cirrhopetalum cornutum Lindl., Bot. Reg. 24: misc.75, no.138. 1838; Hook. f., Fl. Brit. India 5: 774. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 87, t. 120. 1898; Bruhl, Guide Orch. Sikkim. 73. 1926; Banerji, Orch. Nepal. 100. 1982.

Bulbophyllum cornutum sensu (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 261. 1861.

Phyllorchis helenae Kuntze, Revis. Gen. Pl. 2: 676. 1891.

Rhytionanthos cornutum (Lindl.) Garay, Hamer & Siegerist, Nordic J. Bot. 14(6): 637. 1994. Lucksom, Orch. Sikkim N.E. Himal. 686-687. t. 725, pl. 30. 2007.

Plant epiphytic, 18-35 cm tall, rhizomatous herb. Pseudobulbs 4.6-5.9 × 2.4-3 cm, clustered, ovoid-cylindric, compressed. Leaf solitary, 18-28 × 3.1-3.8 cm, oblong-elliptic, obtuse, petiolate. Inflorescence basal from pseudobulb, suberect, umbel, 5 to 8-flowered; peduncle 9-17 cm long, slender; pedicellate-ovary 8-9 mm long. Flowers 1-2.6 cm long, pale with reddish brown, glabrous; floral bracts narrowly lanceolate. Dorsal sepal 5-7 × 4-5 mm, ovate, subacute to acute, hooded over column, scabrid, margins entire to minutely serrate; lateral pair 2.8-3.5 × 0.4-0.5 cm, narrowly lanceolate, falcate, acuminate, connivent cantrally, free at base and apex, shortly ciliate. Petals 2.7-3 × 2.5-2.8 mm, ovate, acute, ciliate-dentate. Lip 3-4 × 0.9-1.6 mm, simple, dark-brown, oblong, subacute, deflexed; disc 2-lamellate. Column 1-1.3 mm tall, broad; stelia 2; foot curved. Anther cap papillose; pollinia 2.

Flowering : May – August; Fruiting: July – September.
 Specimen cited : Mim forest 2000 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0908**, dt. 23. 07. 2009.
 Status : Common.
 Local distribution : Todey-Tangta, Kafer, Dilaram, Sonada, 600–2100 m.
 General distribution : North West India, Nepal, North East India, Myanmar and Thailand.

Bulbophyllum hirtum (J.E. Sm.) Lindl., Gen. Sp. Orchid. Pl.: 51.1830; Hook. f., Fl. Brit. India 5: 762. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 84, t. 117. 1898; Bruhl, Guide Orch. Sikkim. 201. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 375. 1979; Banerji, Orch. Nepal. 93. 1982; Pradhan & Pradhan, 100 Beaut. Orch. 38. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 115. 1998; Bose *et al.* Orch. India. 116. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 463. 2002; M. Pradhan, 100 N.E. Indian Orch. 154-155. 2006; Lucksom, Orch. Sikkim N.E. Himal. 716. t. 770, pl. 33. 2007; Misra, Orch. India. 283. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 10. 2012.

Stelis hirta J.E. Sm., Rees, Cycl. 34: Stelis, no. 11. 1819.

Tribrachia hirta (J.E. Sm.) Lindl., Coll. Bot.: 41. 1826.

Bulbophyllum suave Griff., Not. Pl. Asiat. 3: 292. 1851.

Phyllorchis hirta (J.E. Sm.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

Plant epiphytic herb, 13-40 cm tall. Pseudobulbs 3-4.3 × 1.7-2.5 cm, crowded, ovoid-cylindric to globose, terete. Leaves 2, 10-17 × 2-3.6 cm, elliptic-oblong, flaccid, subacute, petiolate. Inflorescence 26-39 cm long, basal from pseudobulb, erect, racemes, densely 46 to 70-flowered; peduncle 14-22 cm tall, sheathed; rachis 9-18 cm long, pendent; pedicellate-ovary 3-3.6 mm long, hairy. Flowers 4.5-9 mm long, whitish-green; floral bracts ovate. Dorsal sepal 5-7.5 × 2-2.4 mm, lanceolate, acute, hirsute; lateral pair 6-7 × 3-4 mm. Petals 1.4-1.8 × 1.1-1.4 mm, ovate, acute,

margins ciliate. Lip 2.8-3.7 × 1-1.3 mm, yellow, decurved, oblong; epichile broad, emarginated, upper surface papillose at margins, grooved centrally. Column 1-1.5 mm tall, column white; foot curved. Anthers yellow; pollinia 2.

Flowering : October – December; Fruiting: December – February.
Specimen cited : Chuikhim Busty 570 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 9290**, dt. 25. 10. 2007.
Status : Frequent.
Local distribution : Samalbung, Algarah, Bong busty, Pedong, Mungpoo, Echey Busty, Rungdung Valley, 900–2000 m.
General distribution : India (Meghalaya, Sikkim, Utter Pradesh, West Bengal); Myanmar and Nepal.

Bulbophyllum hymenanthum Hook. f., Fl. Brit. India 5(2): 767. 1890; Icon. Pl. 21:t.2046. 1890 et Fl. Brit. India 5: 767. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 76, t. 103. 1898; Bruhl, Guide Orch. Sikkim. 197. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 406. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 119. 1998; Bose *et al.* Orch. India. 116. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 461. 2002; Lucksom, Orch. Sikkim N.E. Himal. 714. t. 767, pl. 33. 2007; Misra, Orch. India. 283. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 10. 2012.
Phyllorchis hymenantha (Hook. f.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

Plant epiphytic, rhizomatous herb, 1.7-2.3 cm tall, Pseudobulbs absent. Leaf solitary, 1.6-2.3 × 0.5-0.9 cm, ovate-elliptic, obtuse, sessile. Inflorescence erect, 2-flowered; peduncle 2.4-2.8 cm long, filiform; pedicellate-ovary 3 mm long. Flowers 7-9 mm across, yellow streaked with purple; floral bracts ovate-lanceolate. Dorsal sepal 7-9 × 3-3.5 mm, lanceolate-ovate, acute; lateral pair 7-9 × 3-3.5 mm, spreading, ovate, acute. Petals 4-5 × 1-1.7 mm, elliptic-lanceolate, obtuse. Lip 5-6 mm long, purple, abruptly deflexed near base, ovate-lanceolate, upper surface grooved, apex narrowed, base slightly cordate, stipitate. Column 0.8-1 mm long; foot curved. Anther ovate; pollinia 2.

Flowering : May – July; Fruiting: June – August.
Specimen cited : Ramam forest 2600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0463**, dt. 28. 05. 2008.
Status : Threatened.
Local distribution : Gorkhey, Senchale, Rambhi forest, Baggonra, 1400 – 2800 m.
General distribution : India (Darjeeling, Sikkim, Khasi hills).

Bulbophyllum khasyanum Griff., Not. Pl. Asiat. 3: 284. 1851; King & Pantl., Orch. Sikkim Himal. 89. 1898; Chowdhery, Orch. Fl. Arun. Pradh. 74. 1998; Bose *et al.* Orch. India. 118. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 459. 2002; Lucksom, Orch. Sikkim N.E. Himal. 713. t. 764, pl. 33. 2007; Misra, Orch. India. 283. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 10. 2012.

Bulbophyllum conchiferum Rchb. f., Walpers, Ann. Bot. Syst. 6: 253. 1861; Hook. f., Fl. Brit. India 5: 766. 1890.

B. gibsonii Lindl. *ex* Rchb. f., Gard. Chron. n.s. 10: 716. 1878.

B. bowringianum Rchb. f., Gard. Chron. n.s. 15: 814. 1881.

B. cylindraceum var. *khasyanum* (Griff.) Hook. f., Fl. Brit. India 5(2): 765. 1890.

Phyllorchis conchifera (Rchb. f.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

Plant epiphytic, rhizomatous herb, 22-34 cm tall. Pseudobulbs attenuate. Leaf solitary, 14-26 × 3.2-4.5 cm, oblong-elliptic, obtuse, coriaceous, petiolate. Inflorescence racemes, erect, cylindric, densely many-flowered; peduncle 14-31 cm tall, slender; rachis 2.8-4 cm long, deflexed; pedicellate-ovary 2.5-3.5 mm long. Flowers 3-5 mm long, bluish-purple; floral bracts ovate-lanceolate. Dorsal sepal 3-5 × 2-4 mm, cordate-lanceolate, acute, recurved at apex; lateral pair 4-5 × 2-4 mm, ovate, acute, hairy. Petals 2-2.6 × 1-1.5 mm, oblong, denticulate. Lip 2.5-3.5 mm long, brown purple, jointed with the column base, simple, oblong, decurved towards base. Column 1-1.5 mm long, erect with short foot, slipper-shaped, 3-toothed at apex. Anther quadrate; pollinia oval, yellow.

Flowering	: October – December; Fruiting: December – January.
Specimen cited	: Todey forest 1470 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1004 , dt. 26. 10. 2009.
Status	: Common.
Local distribution	: Algarah, Rachela, Damsang forest, Lopchu, Takdah, Rambi forest, Rimbick, 1400 – 2500 m.
General distribution	: India (Meghalaya, Sikkim and West Bengal).

Bulbophyllum leopardinum (Wall.) Lindl., Gen. Sp. Orchid. Pl.: 48. 1830; Hook. f., Fl. Brit. India 5: 756. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 67, t.92. 1898; Bruhl, Guide Orch. Sikkim. 200. 1926; Tuyama in Hara, Fl. E. Himal. 1: 427. 1966; Tuyama in Hara, Fl. E. Himal. 2: 177. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 380. 1979; Banerji, Orch. Nepal. 93. 1982; Hedge, Orch. Arun. Pradh. 58. 1984; Deva & Naithani, Orch. N.W. Himal. 209. t. 208. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 39. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 119. 1998; Bose *et al.* Orch. India. 118. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 442. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 170-171. 2005; *et* 100 N.E. Indian Orch. 158-159. 2006; Lucksom, Orch. Sikkim N.E. Himal. 691. t. 730, pl. 30. 2007; Misra, Orch. India. 283. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et*

Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 10. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 102. 2013.
Dendrobium leopardinum Wall., Tent. Fl. Nepal. 1: 39, t.28. 1826.
Sarcopodium leopardinum (Wall.) Lindl., Paxton's Fl. Gard. 1: 155. 1850.
Phyllorchis leopardina (Wall.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

Plant epiphytic, 11-28 cm tall, rhizomatous herb. Pseudobulbs 4-7 × 1.6-2.8 cm, clustered, cylindrical-obpyriform. Leaf solitary, 8-19 × 3.6-6 cm, oblong-elliptic, mucronate, coriaceous, petiolate. Inflorescence very short, 1-3-flowered; peduncle 1.2-1.5 cm long; pedicellate-ovary 3.5-4.5 cm long, slender. Flowers 2-2.9 cm across, pale yellowish-brown to greenish, spotted with purple; floral bracts ovate. Dorsal sepal 1.8-2.1 × 0.9-1.2 cm, ovate-lanceolate, acute; lateral pair 1.9-2.2 × 0.9-1.5 cm, obliquely ovate, acuminate, forming a mentum. Petals 1.1-1.4 × 0.7-0.8 cm, ovate, acute. Lip 1.3-1.6 × 0.6-0.8 cm, pale-white suffused with scarlet red, fleshy, ovate-lanceolate, obtuse, entire, decurved; disc with toothed auricles at base. Column thick; foot curved. Anther conical; pollinia 4.

Flowering : June – August; Fruiting: July – November.
 Specimen cited : Kafer forest 1860 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1217**, dt. 05. 06. 2010.
 Status : Sparse.
 Local distribution : Lava, Rimbick, Ramam, Charkhol, Rambi forest, Algarah, Neora Valley, Palmajua, 1300 – 2400 m.
 General distribution : India (North East India, West Bengal); Bhutan, Myanmar, Nepal and Thailand.

Bulbophyllum odoratissimum (J.E. Sm.) Lindl., Gen. Sp. Orchid. Pl.: 55. 1830; Hook. f., Fl. Brit. India 5: 758. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 79, t. 109. 1898; Bruhl, Guide Orch. Sikkim. 203. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 426. 1979; Banerji, Orch. Nepal. 93. 1982; Hedge, Orch. Arun. Pradh. 58. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 123. 1998; Bose *et al.* Orch. India. 122. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 447. 2002; M. Pradhan, 100 N.E. Indian Orch. 156-157. 2006; Lucksom, Orch. Sikkim N.E. Himal. 693-694. t. 733, pl. 31. 2007; Misra, Orch. India. 284. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 10. 2012.

Stelis odoratissima J.E. Sm., Rees, cycl. 34: Stelis, no. 12. 1814.

S. caudata D. Don, Prodr. Fl. Nepal.: 32 1825.

Tribrachia odoratissima (J.E. Sm.) Lindl., Col. Bot. 8: *sub* t.41. 1826.

Phyllorchis odoratissima (J.E. Sm.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

Bulbophyllum congestum Rolfe, Bull. Misc. Inform. Kew 1912: 131. 1912.

B. hyacinthiodorum W.W. Sm., Notes Roy. Bot. Gard. Edinburg 13: 190. 1921.

var. *odoratissimum*

Plant epiphytic, 6-11 cm tall, rhizomatous herb. Pseudobulbs 1.8-2.3 × 0.5-0.8 cm, erect, cylindrical, smooth to ridged. Leaf solitary, 3.5-5 × 1.4-1.6 cm, oblong-lanceolate, tip emarginated, petiolate. Inflorescence solitary, basal from pseudobulb, capitate, densely 7 to 15-flowered; peduncle 3.5-8 cm long; pedicellate-ovary 4-4.5 mm long, slender. Flowers 0.8-1 cm across, white; floral bracts lanceolate. Dorsal sepal 5-6 × 2-2.5 mm, lanceolate, acuminate; lateral pair 6-6.9 × 1.8-2.4 mm, lanceolate, acuminate, falcate. Petals 1.3-1.5 × 0.8-1 mm, spreading, ovate, obtuse. Lip 1.2-1.5 × 0.3-0.5 mm, yellow, fleshy, oblong-lanceolate, centrally grooved. Column 0.7-0.9 × 0.4-0.5 mm, stout; foot short. Anther ovate; pollinia yellow.

Flowering : July – August; Fruiting: August – October.
 Specimen cited : Tangta forest 2400 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0083**, dt. 08. 08. 2007.
 Status : Common.
 Local distribution : Algarah, Nokdara, Dowhill-Kurseong, Takdah, Pattabong, 1000 – 1900 m.
 General distribution : India (North East India, Sikkim); China, Myanmar, Nepal, Thailand and Vietnam.

Bulbophyllum odoratissimum (J.E. Sm.) Lindl. var. *racemosum* N.P. Balakr., J. Bombay Nat. Hist. Soc. 75(1): 157, f.2. 1978; Pearce & Cribb, Fl. Bhutan, 3(3): 448. 2002; Misra, Orch. India. 284. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 11. 2012.

Bulbophyllum trichocephalum (Schltr.) Lucksom var. *racemosum* (Balakr.) Lucksom *comb. nov.* Lucksom, Orch. Sikkim N.E. Himal. 695. t. 735, pl. 31. 2007.

Plant epiphytic, 7-16 cm tall, rhizomatous herb. Pseudobulbs 2.2-3.8 × 0.7-1.5 cm, cylindrical, fusiform. Leaf solitary, 5-9.5 × 1.3-2 cm, coriaceous, elliptic-oblong, subacute to retuse, subsessile. Inflorescence 2, 10.5-16 cm long, basal from pseudobulb, racemes, laxly 11 to 20-flowered; peduncle sheathed; pedicel and ovary 0.8-1 cm long. Flowers 1.5-2 cm across, white; floral bracts ovate-lanceolate. Sepals similar, linear-lanceolate, obtuse, falcate. Dorsal sepal 0.7-0.8 × 0.2-0.25 cm; lateral pair 0.9-1.3 × 0.2-0.26 cm. Petals 1.5-2 × 1-1.3 mm, elliptic-ovate, acute. Lip 1.3-1.5 × 1 mm, simple, yellow, adnate to tip of column foot, fleshy, ovate to lanceolate, acute, minutely tuberculate on upper surface, grooved centrally. Column 1.8-2 mm long. Anther ovate; pollinia 4.

Flowering : June – July; Fruiting: July – September.
 Specimen cited : Pedung Busty 890 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1633**, dt. 27. 06. 2011.
 Status : Sparse.
 Local distribution : Damsang forest, Sendaybong, Lopchu, 1200–1450 m.

General distribution : North East India (Sikkim); Bhutan.

Bulbophyllum polyrhizum Lindl., Gen. Sp. Orchid. Pl.: 53. 1830; Hook. f., Fl. Brit. India 5: 767. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 70, t. 95. 1898; Bruhl, Guide Orch. Sikkim. 205. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 428. 1979; Banerji, Orch. Nepal. 94. 1982; Deva & Naithani, Orch. N.W. Himal. 209–211. t. 210. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 131. 1998; Bose *et al.* Orch. India. 124. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 452. 2002; M. Pradhan, 100 N.E. Indian Orch. 160-161. 2006; Lucksom, Orch. Sikkim N.E. Himal. 703. t. 748, pl. 32. 2007; Misra, Orch. India. 284. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1537. 2012; *et McAllen Int. Orch. Soc. J.*13(10): 11. 2012; Misra, Orch. Odisha. 308-309. 2014.

Phyllorchis polyrhiza (Lindl.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

Plant epiphytic, rhizomatous herb, 4-9 cm tall. Pseudobulbs 0.6-1.3 × 0.5-0.9 cm, clustered, globose-ovoid, base broad. Leaf solitary, 4-8.5 × 0.4-1 cm, absent at anthesis, oblong, acute, petiolate. Inflorescence racemes, secund, laxly 3 to 7 flowered; peduncle 2-4.5 cm long; rachis 1.3-3.5 cm long, glabrous; pedicellate-ovary 1.7-2.8 mm long, base hooked, slender. Flowers 5-9 mm long, yellow to greenish-yellow; floral bracts oblong. Dorsal sepal 5-6 × 2.5-2.8 mm, ovate-lanceolate, subacute; lateral pair 5-6 × 1.8-2 mm, oblong-lanceolate, subacute, adnate at base. Petals 2-2.5 × 0.8-1.2 mm, ovate, acute. Lip 3.3-3.9 × 0.8-1.1 mm, yellow, oblong, obtuse, scabrous, deflexed from the base, stipitate, base grooved. Column 1-1.2 mm long; stielidia short, acute; foot curved. Anther cap papillose; pollinia sub-globose.

Flowering : March – April; Fruiting: April – June.

Specimen cited : Balasan 470 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1103**, dt. 26. 03. 2010.

Status : Threatened.

Local distribution : Majitar, Mungpoo, Lesh khola, Rangit Valley, 300 – 800 m.

General distribution : India (Darjeeling hills, Sikkim, Western Himalaya).

Bulbophyllum reptans (Lindl.) Lindl., Gen. Sp. Orchid. Pl.: 51. 1830; Hook. f., Fl. Brit. India 5: 768. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 77, t. 106. 1898; Bruhl, Guide Orch. Sikkim. 205. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 429. 1979; Banerji, Orch. Nepal. 94. 1982; Deva & Naithani, Orch. N.W. Himal. 211. t. 212. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 136. 1998; Bose *et al.* Orch. India. 126. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 452 & 454-453, t. 454. 2002; Lucksom, Orch. Sikkim N.E. Himal. 702-703. t. 747, pl. 31. 2007; Misra, Orch. India. 284. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et*

Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 11. 2012.

Stelis racemosa J.E. Sm., Rees, Cycl. 34: Stelis no. 10. 1819.

Tribrachia reptans Lindl. Collect. Bot.: t.41a. 1826.

Bulbophyllum grandiflorum Griff., Itin. Pl. Khasyah Mts.: 146, no.705. 1848; Not. Pl. Asiat. 3: 293 1851; Icon. Pl. Asiat. 3: t.294. 1851.

B. clarkei Rchb. f., Flora 71: 155 1888.

B. reptans var. *subracemosum* Hook. f., Fl. Brit. India 5(2): 769. 1890.

Phyllorchis reptans (Lindl.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

Sunipia racemosa (J.E. Sm.) Tang & Wang, Acta Phytotax. Sin. 1(1): 90. 1951.

Ione racemosa (J.E. Sm.) Seidenf., Bot. Tidsskr. 64: 227. 1969.

Plant epiphytic herb, 8-14 cm tall. Pseudobulbs 1.6-2 × 1.4-1.6 cm, obpyriform, flattened. Leaf solitary, 8-16 × 0.8-1.3 cm, linear-oblong, subacute, obliquely notched, petiolate. Inflorescence solitary or 2, basal from pseudobulbs, shorter than leaves, racemes, laxly few-flowered; peduncle filiform; rachis filiform; pedicellate-ovary 3-3.5 mm long, glabrous. Flowers 0.8-1 cm long, pale-green with dark purple spots; floral bracts oblong-lanceolate. Dorsal sepal 6-7.6 × 1.7-2 mm, ovate-oblong, subacute, margins undulate; lateral pair 7.5-8 × 2.5-3 mm, lanceolate, acute, slightly falcate, adnate to column foot. Petals 2.7-3.7 × 1-1.2 mm, oblong, obtuse. Lip 3.5-4 × 1-1.2 mm, simple, yellowish-green, stipitate, deflexed centrally, apex narrowed, margins narrowly winged. Column with 2 triangular projecting wings; stelidia filiform; foot curved.

Flowering : October – December; Fruiting: November – February.

Specimen cited : Lava forest 2240 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0037**, dt. 10. 02. 2007.

Status : Sparse.

Local distribution : Today-Tangta, Chimney, Hill top, 1600 – 2700 m.

General distribution : India (Eastern and Western Himalayas); Bhutan, Myanmar, China, Nepal, Thailand, Vietnam.

Bulbophyllum rigidum King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 69, t.94. 1898; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 198. 1926; Bose *et al.* Orch. India. 126. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 460. 2002; Lucksom, Orch. Sikkim N.E. Himal. 712. t. 762, pl. 33. 2007; Misra, Orch. India. 284. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J. 13(10): 11. 2012.

Plant epiphytic, rhizomatous herb, 16-31 cm tall. Pseudobulbs 0.1-0.4 × 0.2-0.3 cm, attenuate, conical. Leaf solitary, 9-26 × 2.5-4.2 cm, ovate-elliptic, obtuse, narrowly at base, petiolate, sheathed. Inflorescence basal from rhizome, racemes, erect, laxly 6 to 18-flowered; peduncle slender; rachis 9-14 cm long, glabrous; pedicellate-ovary

0.3-0.5 cm long. Flowers 0.8-1 cm across, pale-green with reddish-purple streaks; floral bracts ovate-lanceolate. Dorsal sepal 4.6-5 × 3-4 mm, ovate-lanceolate, acute; lateral pair 5-7 × 3.5-4 mm, oblong, obtuse, connate below. Petals 2.8-3.3 × 1.4-1.8 mm, oblong, subacute, apex erose. Lip 4.5-5 × 2.5-3 mm, simple, lip brownish-yellow, red-spotted at base, elliptic-oblong, obtuse, margins deflexed, glabrous. Column 1.7-2 mm long, broad. Anther cap depressed; pollinia unequal.

Flowering : June – September; Fruiting: July – November.
Specimen cited : Todey forest 1350 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1348**, dt. 23. 07. 2010.
Status : Rare.
Local distribution : Lava, Takdah, Rambi forest, Algarah, Chimney, 1600 – 2200 m.
General distribution : India (Sikkim).

Bulbophyllum rolfei (Kuntze) Seidenf., Dansk Bot. Ark. 33(3): 149. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 140. 1998; Bose *et al.* Orch. India. 126. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 475. 2002; Lucksom, Orch. Sikkim N.E. Himal. 707-708. t. 755. 2007; Misra, Orch. India. 284. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1537. 2012; *et McAllen Int. Orch. Soc. J.*13(10): 11. 2012.

Cirrhopetalum parvulum Hook. f., Fl. Brit. India 5(2): 778. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 92, t.128. 1898; Bruhl, Guide Orch. Sikkim. 71. 1926.

Phyllorchis rolfei Kuntze, Revis. Gen. Pl. 2: 276. 1890.

Cirrhopetalum dyerianum King & Pantl., J. Asiat. Soc. Bengal 64(3): 335. 1896.

Bulbophyllum parvulum sensu J.J. Sm., Bull. Jard. Bot. Buitenzorg ser.2(8): 27. 1912, non Lindl. 1830.

B. dyerianum (King & Pantl.) Seidenf., Dansk Bot. Ark. 29(1): 175. 1973.

Plant epiphytic, 3-6 cm tall, rhizomatous herb. Pseudobulbs 0.6-1.7 × 0.4-1.1 cm, ovoid to ovoid-falcate. Leaf solitary, 2.3-4 × 0.9-1.2 cm, oblong-elliptic, subacute, petiolate. Inflorescence basal from pseudobulb, 2 to 4-flowered; peduncle 2.6-4.5 cm long; rachis 2-3 mm long; pedicel and ovary 5-7 mm long, glabrous. Flowers 9-1.4 cm long, pale-yellowish green suffused with dark-purple; floral bracts lanceolate. Dorsal sepal 5-6 × 1.8-2.4 mm, oblong-ovate, acute; lateral pair 1.1-1.4 × 0.2-0.12 cm, linear-oblong, acuminate, falcate, divergent, adnate at base. Petals 3.8-4.7 × 1.5-2.2 mm, ovate, acute, margins erose. Lip 3-4 × 0.8-1.3 mm, dark red-purple, fleshy, narrowly oblong, tapering to subacute apex, decurved, upper surface grooved from base to apex. Column 1-1.3 mm long; stelidia dentate, erect; foot elongate, curved. Anther papillose; pollinia elliptic.

Flowering : August–September; Fruiting: September–November.

Specimen cited : Neora Valley 2600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1686**, dt. 13. 09. 2011.
 Status : Threatened.
 Local distribution : Dansang Gari, Rimbick, 1900 – 2800 m.
 General distribution : India (Sikkim, Nagaland); Bhutan, Nepal.

Bulbophyllum roxburghii (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 263. 1861; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bose *et al.* Orch. India. 128. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 469. 2002; & McAllen Int. Orch. Soc. J. 13(10): 11. 2012.

Cirrhopetalum roxburghii Lindl., Gen. Sp. Orchid. Pl.: 58. 1830.

Aerides radiatum Roxb., Fl. Ind. ed. 1832, 3: 476. 1832.

Cirrhopetalum sikkimense King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8:90, t.125. 1898; Bruhl, Guide Orch. Sikkim. 72. 1926; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538. 2012.

Bulbophyllum sikkimense (King & Pantl.) J.J. Sm., Rev. Gen. 2(8): 28. 1912; Pradhan & Pradhan, 100 Beaut. Orch. 41. 1997; Pradhan, Indian Orch. Guide Identif. Cult. 2: 391. 1979; Lucksom, Orch. Sikkim N.E. Himal. 685-686. t. 723, pl. 30. 2007.

Plant epiphytic, rhizomatous herb, 7-8.4 cm tall. Pseudobulbs 0.7-1.4 × 0.5-0.8 cm, ovoid-globose, sheathed. Leaf solitary, 3.4-5 × 1-1.8 cm, coriaceous, oblanceolate, obtuse, obliquely emarginated, petiolate. Inflorescence basal from pseudobulb, umbel, 7 to 12-flowered; peduncle 5-6 cm long, slender; pedicellate-ovary 4-5 mm long, slender. Flowers 0.8-1.4 cm long, pale-green, speckled with dark-purple; floral bracts lanceolate. Dorsal sepal 2.3-2.7 × 1.5-1.8 mm, free, ovate, acute-aristate, concave, margins long ciliate-setose; lateral pair 8-11 × 1.8-2 mm, narrowly oblong, obtuse, slightly falcate, connivent, free at base. Petals 2.2-2.4 × 0.9-1.3 mm, ovate, margins ciliate-aristate, subacute, base oblique. Lip 1.9-2.4 mm, simple, yellow, broadly ovate, tip acute, margins entire. Column 1.3-1.7 mm long, broad; foot curved. Anther ovate; pollinia 4.

Flowering : April – June; Fruiting: June – August.
 Specimen cited : Yangmakum Busty 600 m, **Rajendra Yonzone, D. Lama and R.B. Bhujel 1193**, dt. 28. 05. 2010.
 Status : Endangered.
 Local distribution : Pareng, Solok, Lesh khola, 300 – 700 m.
 General distribution : India (North East India).

Bulbophyllum sarcophyllum (King & Pantl.) J.J. Sm., Bull. Jard. Bot. Buitenzorg ser.2, 8: 27. 1912; Hook. f., Fl. Brit. India 5: 857. 1890; Pradhan, Indian Orch. Guide Identif. Cult. 2: 415-416. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 140. 1998; Bose *et al.* Orch. India. 128. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 476. 2002; Lucksom, Orch. Sikkim N.E. Himal. 710. t. 759. 2007; Misra, Orch. India. 284. 2007; Yonzone

et al. Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1537. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 11. 2012.

Cirrhopetalum sarcophyllum King & Pantl., J. Asiat. Soc. Bengal. 64(3): 335. 1896 & Ann. Roy. Bot. Gard. Calcutta 8: 91, t.126. 1898; Bruhl, Guide Orch. Sikkim. 70. 1926.

Bulbophyllum panigrahianum S. Misra, Nordic J. Bot. 6(1): 25. 1986.

Plant epiphytic, 10-19 cm tall, rhizomatous herb. Pseudobulbs 2.8-4.5 × 4-5 mm, discoid, compressed. Leaf solitary, 7.5-11 × 3.5-4 cm, coriaceous, pendent, oblong-lanceolate, acute, slightly falcate, petiolate. Inflorescence 7-7.5 cm tall, pendent, umbel, 4 to 7-flowered; peduncle 7-7.5 cm long; pedicellate-ovary 5-6 mm long, slender. Flowers 1.5-2 cm long, reddish-brown, mottled with yellow; floral bracts lanceolate. Dorsal sepal 0.7-0.9 × 0.2-0.3 cm, ovate-lanceolate, acute; lateral pair 1.4-1.8 × 0.2-0.3 cm, narrowly lanceolate, acute, united centrally, base and apices free, glandular. Petals 0.4-0.5 × 0.1-0.2 cm, oblong, falcate, acute. Lip 3-4 mm long, purplish, spotted with deeper purple, oblong, grooved centrally. Column 2.5-3 mm tall, stout; foot curved. Anther oblong; pollinia 2.

Flowering : June – September; Fruiting: July – November.

Specimen cited : Nim forest 750 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0951**, dt. 20. 09. 2009

Status : Rare.

Local distribution : Jalapahar, Nimbong, Chisang-Godok, Jalapahar, 600 – 1400 m.

General distribution : India, (Sikkim, Meghalaya); Bhutan.

Bulbophyllum scabratum Rchb. f., Walpers, Ann. Bot. Syst. 6: 259. 1861; Pradhan, Indian Orch. Guide Identif. Cult. 2: 388. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 142. 1998; Bose *et al.* Orch. India. 128. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 470. 2002; Lucksom, Orch. Sikkim N.E. Himal. 707. t. 754, pl. 32. 2007; Misra, Orch. India. 284. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 11. 2012.

Cirrhopetalum caespitosum Wall. *ex* Lindl., Bot. Reg. 24: misc.35, no.53. 1838; Hook. f., Fl. Brit. India 5: 775. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 92, t. 127. 1898; Bruhl, Guide Orch. Sikkim. 69. 1926.

Bulbophyllum confertum Hook. f., Fl. Brit. India 5(2): 757. 1890.

Plant epiphytic herb, 7-10 cm tall. Pseudobulbs 1.1-1.8 × 0.7-1 cm, caespitose, narrowly conical-ovoid, erect to curved. Leaf solitary, 5-10 × 0.7-1.2 cm, elliptic-oblong, acute, keeled beneath, petiolate. Inflorescence basal, 3.5-4.8 cm long, erect, shorter than leaves, subumbel, 4 to 6-flowered; peduncle 3-3.8 cm long, filiform; pedicellate-ovary 5-7.6 mm long, slender. Flowers 1-1.4 cm long, yellow; floral bracts lanceolate. Dorsal sepal 4.5-5.3 × 2.7-3.4 mm, free, ovate, acuminate, concave, hooded, minutely scabrid; lateral pair 8-10 × 3-4.5 mm, linear-lanceolate,

obtusely acuminate-caudate, connivent at base, minutely scabrid. Petals 2.9-3.7 × 1.9-2.4 mm, broadly ovate, acute, margins erose-dentate. Lip 1.7-1.9 × 0.5-0.8 mm, simple, fleshy, oblong, subacute, margins entire. Column 1-1.2 mm long thick; foot curved. Anther dome shaped; pollinia 4.

Flowering : April – May; Fruiting: May – July.
Specimen cited : Rachela forest 2850 m, **Rajendra Yonzone, D. Lama and R.B. Bhujel 0324**, dt. 21. 04. 2008.
Status : Common.
Local distribution : Lower Lungshel, Takdah, Algarah, Lungshel, 1200 – 1800 m.
General distribution : India (Darjeeling, Meghalaya); Nepal.

Bulbophyllum secundum Hook. f., Fl. Brit. India 5(2); Icon. Pl. 21:t.2042. 1892; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 75, t. 101. 1898; Bruhl, Guide Orch. Sikkim. 199. 1926; Tuyama in Hara, Fl. E. Himal. 2: 179. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 392. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 142. 1998; Bose *et al.* Orch. India. 128. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 457. 2002; Lucksom, Orch. Sikkim N.E. Himal. 705. t. 751. 2007; Misra, Orch. India. 284. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 11. 2012.
Phyllorchis secunda (Hook. f.) Kuntze, Revis. Gen. Pl. 2: 678. 1891.

Plant epiphytic herb, 7-17 cm tall. Pseudobulbs 5-9 cm diam., crowded, discoid-turbinate, flat. Leaf solitary, 3-6.5 × 0.4-0.7 cm, narrowly oblong, subacute, narrowed at base, petiolate. Inflorescence basal from pseudobulbs, filiform, racemes, secund, laxly 8 to 13-flowered; peduncle glabrous; rachis 5-8 cm long, filiform; pedicel and ovary 1.5-2 mm long. Flowers 3-4.6 mm long, pale-green, suffused with purple; floral bracts ovate-lanceolate. Dorsal sepal 2.7-3 × 1-1.2 mm, lanceolate, subacute, margins ciliate; lateral pair 2.6-3 × 1.4-1.8 mm, ovate, subacute, adnate at base to column foot. Petals 1.6-1.9 × 0.7-0.9 mm, oblong-spathulate, obtuse, apical margin long-ciliate. Lip 2-2.5 × 0.6-0.8 mm, simple, dark purple, oblong, base truncate to slightly cordate, dilated centrally, obtuse, margins ciliate. Column 1-1.5 mm long, straight; stelidia anterior, shortly triangular; foot short, curved. Anther dome shaped; pollinia oval-shaped.

Flowering : May – July; Fruiting: June – September.
Specimen cited : Lopchu forest 1500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1621**, dt. 18. 06. 2011.
Status : Sparse.
Local distribution : Damsang Gari, Rangayrung, 1400 – 2300 m.
General distribution : India (Sikkim, Nagaland); Myanmar, Nepal, China, Laos, Thailand and Vietnam.

Bulbophyllum stenobulbon Par. & Rchb. f., Trans. Linn. Soc. London 30: 153. 1874; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pearce & Cribb, Fl. Bhutan, 3(3): 449. 2002; Lucksom, Orch. Sikkim N.E. Himal. 698-699. t. 742, pl. 31. 2007; Misra, Orch. India. 285. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 11. 2012.

B. clarkeanum King & Pantl., J. Asiat. Soc. Bengal 64(3): 333. 1896; Bruhl, Guide Orch. Sikkim. 204. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 410. 1979; Bose *et al.* Orch. India. 110. 1999.

B. youngsayeanum S.Y. Hu & Barrette, Chung Chi J. 13(2): 29. 1976.

Plant epiphytic, 3-5 cm tall, rhizomatous herb. Pseudobulbs 1-1.4 × 0.5-0.7 cm, ovoid-globose, obtuse. Leaf solitary, 2.5-3.2 × 0.8-1 cm, narrowly oblong-elliptic, tip notched, subsessile. Inflorescence basal, 2 or 3-flowered; peduncle 2-2.3 cm long, slender; rachis 4-6 mm long; pedicellate-ovary 4.6-5.5 mm long, slender. Flowers 6-7 mm across, yellowish white, tinged with orange-red; floral bracts lanceolate. Dorsal sepal 5-5.4 × 2-2.4 mm, lanceolate, acuminate, apex thickened; lateral pair 7-9 × 2.5-2.9 mm. Petals 3-3.8 × 1-1.4 mm, broadly ovate, obtuse. spurs 2-3 mm long. Lip 3.5-4 mm long, simple, lip yellowish white, ovate, acute, decurved, margins erose. Column 2-3 mm long, with long projecting spurs. Anther orbicular; pollinia unequal.

Flowering : May – June; Fruiting: June – August.

Specimen cited : Kalijhora forest 370 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0870**, dt. 22. 05. 2009.

Status : Rare.

Local distribution : Guling forest, Gulma forest, Sepkhola, Rongo, 250 – 700 m.

General distribution : India (Sikkim).

Bulbophyllum striatum (Griff.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 257. 1861; Hook. f., Fl. Brit. India 5: 755. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 75, t.102. 1898; Bruhl, Guide Orch. Sikkim. 203. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 412. 1979; Banerji, Orch. Nepal. 95. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 146. 1998; Bose *et al.* Orch. India. 129. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 449. 2002; Lucksom, Orch. Sikkim N.E. Himal. 702. t. 746. 2007; Misra, Orch. India. 285. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 11. 2012.

Dendrobium striatum Griff., not. Pl. Asiat. 3: 318. 1851.

Sarcopodium striatum (Griff.) Lindl., Fol. Orchid. Sarcopodium 2: 5, no.12. 1853.

Phyllorchis striata (Griff.) Kuntze, Revis. Gen. Pl. 2: 678. 1891.

Bulbophyllum striatitopalum Seidenf., Nordic J. Bot. 2(3): 195. 1982.

Plant epiphytic, rhizomatous herb, 7-13 cm tall. Pseudobulbs 1.1-1.6 × 1-1.5 cm, obpyriform to ovoid, rugose. Leaf solitary, 3.9-11 × 0.5-1.8 cm, coriaceous, elliptic, tip retuse, petiolate; petiole more than 2.5 cm long. Inflorescence shorter than leaves, erect, 2 to 4-flowered; peduncle slender; rachis 4.5-6 mm long; pedicellate-ovary 0.4-0.7 cm long, slender. Flowers 0.9-1.2 cm across, greenish-yellow striped with purple; floral bracts minute. Sepals subequal; dorsal sepal 0.8-1 × 0.25-0.3 cm, broadly lanceolate, subacute, spreading; lateral pair 1-1.2 × 0.3-0.4 cm, oblong-lanceolate, sub-acute. Petals 3-3.8 × 1.2-1.8 mm, lanceolate, subacute. Lip 3-5 × 1.5-2 mm, ovate-lanceolate, recurved at base, simple, base with 2 small, oblong, erect, auriculate lobules. Column 2.7-3 mm long, slender, strongly curved; foot short. Anther conical; pollinia ovoid.

Flowering : October – November; Fruiting: November – January.
 Specimen cited : Today forest 1400 m, **Rajendra Yonzone, D. Lama and R.B. Bhujel 1726**, dt. 05. 11. 2011.
 Status : Sparse.
 Local distribution : Tangta, Rambi forest, Senchale, Ramam, 1800 – 2750 m.
 General distribution : India (Sikkim, Khasi hills) Nepal.

Bulbophyllum thomsonii Hook. f., Fl. Brit. India 5(2): 764. 1890; Icon. Pl. ser.4(2), 21: t.2041. 1892, *non B. thomsonii* Ridl. 1885; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 83, t. 116. 1898; Bruhl, Guide Orch. Sikkim. 202. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 392. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 146-149. 1998; Bose *et al.* Orch. India. 129. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 457. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 172-173. 2005; Lucksom, Orch. Sikkim N.E. Himal. 706. t. 753, pl. 32. 2007; Misra, Orch. India. 285. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 11. 2012.

Phyllorchis thomsonii (Hook. f.) Kuntze, Revis. Gen. Pl. 2: 678. 1892.

Plant epiphytic, rhizomatous herb, 14-19 cm tall. Pseudobulbs 1.2-1.8 × 1.7-2.1 cm, depressed-obturinate, oblique. Leaf solitary, 10-16 × 1.7-2 cm, narrowly oblong, acute, narrowed at base, petiolate. Inflorescence basal from pseudobulb, racemes, erect, subdensely many-flowered; peduncle 6.3-9.2 cm long, slender; rachis 7-17 cm long; pedicellate-ovary 2.5-3 × 1-1.2 mm long, glabrous. Flowers 3-5 mm across, whitish-yellow; floral bracts minute. Dorsal sepal 3.9-4.8 × 1.3-1.7 mm, ovate-lanceolate, acute; lateral pair 4.7-5.7 × 1.5-1.9 mm, ovate-lanceolate, acute, slightly falcate, margins ciliate, adnate to column foot at base. Petals 1.6-1.9 × 0.7-0.9 mm, lanceolate, acute, margins ciliate. Lip 2-2.4 × 0.9-1.3 mm, simple, thick, clawed at base, oblong, apex obtuse, upper surface with an elongate depression near base,

margins ciliate-villose. Column 1 mm tall; foot perpendicular to column. Anther papillose; pollinia 2.

Flowering : October – December; Fruiting: November – January.
Specimen cited : Neora Valley 2500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1023**, dt. 09. 11. 2009.
Status : Rare.
Local distribution : Sukiapokhari, Dabaipani-Takdah, Algarah, 800–2100 m.
General distribution : India (West Bengal, Sikkim); Bhutan.

Bulbophyllum tortuosum (Bl.) Lindl., Gen. Sp. Orchid. Pl.: 50. 1830; Chowdhery, Orch. Fl. Arun. Pradh. 149. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 444. 2002; Lucksom, Orch. Sikkim N.E. Himal. 689-690. t. 727, pl. 30. 2007; Misra, Orch. India. 285. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 454. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 11. 2012.

Diphyes tortuosa Bl., Bijdr.: 311. 1825.

Phyllorchis tortuosa (Bl.) Kuntze, Revis. Gen. Pl. 2: 678. 1891.

Bulbophyllum listeri King & Pantl., J. Asiat. Soc. Bengal 64(3): 334, t.2. 1896; & Ann. Roy. Bot. Gard. (Calcutta) 8:66, t. 90. 1898; Bruhl, Guide Orch. Sikkim. 200. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 379. 1979; Bose *et al.* Orch. India. 120. 1999.

Plant epiphytic, rhizomatous herb, 2-5 cm tall, pendent. Pseudobulbs 3-6 × 2-4 mm, narrowly ovoid, terete, apex annular. Leaf solitary, 2.5-4 × 0.3-0.6 cm, linear-oblong, acute, petiolate. Inflorescence lateral from pseudobulb, solitary-flowered; pedicel and ovary 2-2.5 mm long. Flower 3-4 mm long, dull-green; floral bract minute, lanceolate. Dorsal sepal 1.6-2 × 0.2-0.3 mm, ovate-lanceolate, obtuse, margins ciliate; lateral pair 1.6-2 × 0.24-0.3 mm, curved over lip, apical margins truncate, inner margins connivent to just below apex, outer margins ciliate. Petals 0.3 × 1.7 mm, ovate, obtuse, apical margins erose. Lip 1-1.25 mm long, simple, dark purple, oblong-lanceolate, tip obtuse, stipitate, deflexed from base margins ciliate. Column very short. Pollinia yellow.

Flowering : March – April; Fruiting: April – June.
Specimen cited : Kalijhora forest 450 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1553**, dt. 23. 03. 2011.
Status : Threatened.
Local distribution : Bagrakot, Kumai, Jholung, Kalijhora, Ryang, 200 – 450 m.
General distribution : India (Sikkim); Bhutan.

Bulbophyllum triste Rchb. f., Walper's, Ann. Bot. Syst. 6: 253. 1861; Hook. f., Fl. Brit. India 5: 768. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 73, t.98. 1898; Bruhl, Guide Orch. Sikkim. 199, 202. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 376. 1979; Deva & Naithani, Orch. N.W. Himal. 213. t. 214. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 149-153. 1998; Bose *et al.* Orch. India. 129. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 464. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 174-175. 2005; Lucksom, Orch. Sikkim N.E. Himal. 716-717. t. 771, pl. 33. 2007; Misra, Orch. India. 285. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 11. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 104. 2013; Misra, Orch. Odisha. 320-321. 2014.

Bulbophyllum alopecurum Rchb. f., Gard. Chron. n.s. 14: 70. 1880; Hook. f., Fl. Brit. India 5: 770. 1890.

B. micranthum Hook. f., Fl. Brit. India 5(2): 768. 1890.

Phyllorchis alopecurus (Rchb. f.) Kuntze, Revis. Gen. Pl. 2: 677. 1891.

P. micranthum (Hook. f.) Kuntze, *loc. cit.* 1891.

P. tristis (Rchb. f.) Kuntze, *loc. cit.* 1891.

Plant epiphytic, rhizomatous herb, 9-16 cm tall. Pseudobulbs 1.5-2 cm across, crowded, dorsiventrally flattened. Leaves 2, 8-13 × 1.6-2 cm, absent during anthesis, oblong, acute, subsessile, sheathing base. Inflorescence drooping, racemes, subdensely 28 to 40-flowered; pedicellate-ovary 1.7-2.2 mm long, obconical. Flowers 5.3-7 mm across, purple; floral bracts minute. Dorsal sepal 2.6-3 × 1.3-1.8 mm, oblong-ovate, acute; lateral pair 4.3-4.7 × 1.5-1.7 mm, oblong, obtuse, concave, lateral margins incurved, free and slightly gibbous at base, cohering along median margin for three-quarters of length. Petals 1.4-1.6 × 1.4-1.6 mm, ovate, acute, suboblique. Lip 1.8-2.2 mm long, adnate to column foot, ovate, tip obtuse, base cordate. Column trigonous; foot curved. Anther cap papillose; pollinia globose.

Flowering	: February – April; Fruiting: April – June.
Specimen cited	: Samalbung Busty 700 m, Rajendra Yonzon, D. Lama and R. B. Bhujel 0770 , dt. 19. 02. 2009.
Status	: Rare.
Local distribution	: Godok, Sinjee, Charkhol, Mirik, 1000 – 1800 m.
General distribution	: India (Kumaun, Sikkim, Orissa, Meghalaya, Arunachal Pradesh); Nepal, Bhutan, Myanmar and Thailand.

Bulbophyllum umbellatum Lindl., Gen. Sp. Orchid. Pl.: 56 1830; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 414. 1979; Deva & Naithani, Orch. N.W. Himal. 213. t. 215. 1986; Bose *et al.* Orch. India. 129. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 477. 2002; Lucksom, Orch. Sikkim N.E. Himal. 708-709. t. 757, pl. 32. 2007; Misra,

Orch. India. 285. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 11. 2012; Misra, Orch. Odisha. 316-317. 2014.

Cirrhopetalum maculosum Lindl., Bot. Reg. 27: misc.81, no.173 1841; Bruhl, Guide Orch. Sikkim. 67. 1926.

C. bootanense Griff., Not. Pl. Asiat. 3: 296 1851; Icon. Pl. Asiat. 3: t.299. 1851.

Bulbophyllum maculosa (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 243. 1861.

Bulbophyllum bootanense (Griff.) Par. & Rchb. f., Trans. Linn. Soc. London 30: 153. 1874.

Bulbophyllum maculosum var. *fuscescens* Hook. f., Fl. Brit. India 5(2); 776. 1890.

Bulbophyllum tibeticum Rolfe, Notes Roy. Bot. Gard. Edinburgh 26: 21, t.9. 1913.

B. umbellatum var. *fuscescens* (Hook. f.) Sarkar, J. Econ. Taxon. Bot. 5(5): 1007. 1984.

Rhytionanthos bootanense (Par. & Rchb. f.) Garay, Hamer & Siegerist, Nordic J. Bot. 14(6): 639. 1994. [Fig. 4.28]

Plant epiphytic, rhizomatous herb, 10-17 cm tall. Pseudobulbs 2.8-5.1 × 1.4-1.8 cm, ovoid to broadly conical, rugose. Leaf solitary, 10-18.5 × 1.6-2.3 cm, coriaceous, narrowly oblong, obtuse, emarginated, petiolate. Inflorescence 6-11 cm, shorter than leaves, umbel, 2 to 4-flowered; peduncle 7-9 cm long; pedicellate-ovary 1.6-1.9 cm long, slender. Flowers 1-1.6 cm long; yellow-green, pale pink to yellow-brown; floral bracts lanceolate. Dorsal sepal 0.8-1.1 × 0.5-0.6 cm, ovate, acute, depressed; lateral pair 1.2-1.4 × 0.5-0.6 cm, free, ovate-lanceolate, falcate, subacute, base broad, adnate to column foot. Petals 0.5-0.6 × 0.4-0.5 cm, ovate, obtuse. Lip 0.5-0.6 × 0.4-0.5 mm, simple, green-yellow, oblong, apex subacute, surface grooved. Column 2.3-2.7 mm long, winged; stielidia short, curved; foot curved. Anther 2-chambered; pollinia 4.

Flowering : March – May; Fruiting: April – July.

Specimen cited : Manaybhanjang 2100 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1086**, dt. 22. 03. 2010.

Status : Rare.

Local distribution : Chimney, Dali-Darjeeling, Rambh forest, 1000–2100 m.

General distribution : India (Sikkim, West Bengal, Utter Pradesh); Bhutan, Nepal.

Bulbophyllum wallichii (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 259. 1861; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 374-375. 1979; Banerji, Orch. Nepal. 95. 1982; Deva & Naithani, Orch. N.W. Himal. 213 – 217. t. 216. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 42. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 153. 1998;

Bose *et al.* Orch. India. 131. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 462. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 176-177. 2005; Lucksom, Orch. Sikkim N.E. Himal. 715. t. 768, pl. 33. 2007; Misra, Orch. India. 285. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J. 13(10): 12. 2012.

Cirrhopetalum wallichii sensu Lindl., Bot. Reg. 25: misc.72, no.119. 1839; Bot. Reg. 29: sub t.49, no.8. 1843, non Lindl. 1830; Bruhl, Guide Orch. Sikkim. 72. 1926. *C. refractum* sensu Hook. f., Fl. Brit. India 5(2): 779. 1890, non Zollinger 1847.

Bulbophyllum refractoides Seidenf., Bot. Tidsskr. 65: 342. 1970.

Plant epiphytic herb, 9-18 cm tall. Pseudobulbs 1.3-2.4 × 0.7-1.5 cm, shortly conical, broad-basal. Leaves 2, 7-11 × 1.7-2.6 cm, absent at anthesis, oblong-elliptic, acute, petiolate. Inflorescence lateral from pseudobulb, erect, racemes, laxly 5 to 10-flowered; peduncle 6-14 cm long, slender; rachis 3.5-9 cm long, pendent; pedicel and ovary 2.4-3.4 mm long. Flowers 2.6-5 cm long, pale green to yellow; floral bracts lanceolate to ovate. Dorsal sepal 6-9 × 0.8-1.1 mm, free, narrowly lanceolate, aristate, margins ciliate; lateral pair 2.5-6 × 0.4-0.7 cm, connivent along centre but separate at base, linear-oblong, subacute, sparsely ciliate. Petals 5-8 × 0.8-1.1 mm, fleshy, lanceolate-triangular, aristate, margins ciliate. Lip 1.5-2.7 mm long, simple to obscurely 3-lobed, pale-yellow, oblong, obtuse, basal edges recurve, deflexed centrally. Column 1-1.5 mm tall; stolidia aristate, slender, decurved; foot short. Anther papillose; pollinia yellow.

Flowering : October – December; Fruiting: November – January.

Specimen cited : Takdah forest 1700 m, **Rajendra Yonzon, D. Lama and R.B. Bhujel 1760**, dt. 07. 12. 2011.

Status : Threatened.

Local distribution : Neora Valley, Damsang Gari, Ramam, 1500–2900m.

General distribution : India (Western Himalaya, Kumaon, Sikkim, Nagaland); Nepal, Bhutan, Myanmar, Thailand, Laos, Cambodia and Vietnam.

Bulbophyllum yoksunense J.J. Sm., Bull. Jard. Bot. Buitenzorg ser.2, 8: 29 1912; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 387. 1979; Deva & Naithani, Orch. N.W. Himal. 199 – 200 t. 110. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 74. 1998; Bose *et al.* Orch. India. 131. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 471. 2002; Lucksom, Orch. Sikkim N.E. Himal. 710. t. 758, pl. 32. 2007; Misra, Orch. India. 285. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; *et* McAllen Int. Orch. Soc. J.13(10): 12. 2012.

Cirrhopetalum brevipes Hook. f., Fl. Brit. India 5(2): 777. 1890; Icon. Pl. 21: t.2056. 1892; Bruhl, Guide Orch. Sikkim. 71. 1926.

Phyllorchis brevipes (Hook. f.) Kuntze, Revis. Gen. Pl. 2: 678. 1891.

Bulbophyllum brachypodum var. *parviflorum* A.S. Rao & N.P. Balak., Bull. Bot. Surv. India 10(3-4): 350. 1968.

Plant epiphytic herb, 5-9 cm tall. Pseudobulbs 1.8-3.5 × 0.5-0.9 cm, cylindrical, curved, smooth, sheathed. Leaf solitary, 4-6 × 1-2.2 cm, elliptic-oblong, obtuse, retuse, petiolate. Inflorescence basal from pseudobulb, subumbel, 6 to 12-flowered; peduncle 1.2-1.5 cm long, stout; pedicellate-ovary 6-8 mm long slender. Flowers 1.3-1.7 cm long, dorsally depressed, pale-yellow with dark purple streaks; floral bracts linear. Dorsal sepal 0.7-0.9 × 0.4-0.5 cm, ovate-oblong, acute, margins entire; lateral pair 0.8-1 × 0.5-0.6 cm, oblong-lanceolate, acuminate, connivent with free apices. Petals 0.5-0.6 × 0.4-0.5 cm, broadly ovate, obtuse, margins ciliate. Lip 2-3.5 × 1.2-1.7 mm, purple, attached to apex of column foot, ovate-oblong, obtuse, deflexed centrally. Column 1.5-2 mm tall, stout; foot curved. Anther ovate obtuse; pollinia oblong-ovate.

Flowering : September – October; Fruiting: October – December.
Specimen cited : Tangta forest 2400 m, **Rajendra Yonzone, D. Lama and R.B. Bhujel 1477**, dt. 26. 09. 2010.
Status : Common.
Local distribution : Rachela, Todey, Damsang forest, Rambi forest, Ramam, Rimbick, 1800 – 2800 m.
General distribution : India (Sikkim, West Bengal); Nepal.

Monomeria Lindl.

Plant perennial epiphytic herb. Pseudobulbs on a stout rhizome. Leaf solitary. Flowers resupinate. Inflorescence basal from pseudobulb, racemes, dorsal sepal gaping, half as long as lateral pair; lateral pair with hispid surface, adnate to distal part of column foot; petals reduced, obliquely triangular, margins fimbriate. Lip 3-lobed; side lobes auriculate; disc with 2-lamellae. Column horned at apex; foot long and much curved; pollinia 4.

The genus *Monomeria* Lindl., comprises 3 species distributed from Nepal, North East India, Myanmar and China, to Thailand, Vietnam and New Guinea.

Monomeria barbata Lindl., Gen. Sp. Orchid. Pl.: 61. 1830; Hook. f., Fl. Brit. India 5: 781. 1890; Hedge & A.N. Rao, Indian J. Forestry 10(3): 194. 1987; Bruhl, Guide Orch. Sikkim. 99. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 481. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 95. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 517. 1998; Bose *et al.* Orch. India. 334. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 486,

t. 485. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 180-181. 2005; *et* 100 N.E. Indian Orch. 166-167. 2006; Lucksom, Orch. Sikkim N.E. Himal. 774. t. 780, pl. 34. 2007; Misra, Orch. India. 307. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1545. 2012.

Epicranthes barbata (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 265. 1861.

Monomeria crabo Par. & Rchb. f., Trans. Linn. Soc. London 30: 143, t.28. 1874. [Fig. 4.29]

Plant epiphytic, rhizomatous herb, 18-34 cm tall. Pseudobulbs 4-5.5 × 1.8-2.1 cm, ovoid-ellipsoid. Leaf solitary, 17-24 × 3.5-4 cm, oblong-elliptic, tip emarginated, petiolate. Inflorescence laxly 6 to 13-flowered; peduncle 7-12 cm long; rachis 9-19 cm long, glabrous; pedicellate-ovary 1.8-2.3 cm long, slender. Flowers 2-2.4 cm long, yellowish-green with brown marking; floral bracts lanceolate. Dorsal sepal 1-1.2 × 0.4-0.6 cm, lanceolate, acute; lateral pair 1.4-2 × 0.5-0.6 cm, lanceolate, acute, adnate to apex of column foot and connivent at base to form a small sac, surface hispid. Petals 6-8 × 1.5-2.3 mm, obliquely triangular, outer margins dentate-fimbriate, adnate to base of column foot. Lip 7-9 × 2.5-3 mm, yellow, 3-lobed, deflexed centrally; side lobes falcate-auriculate, projecting forwards; apical lobe lanceolate, obtuse; disc 2-lamellae. Column 4-5 × 4.5 mm tall, purple-spotted, winged; foot curved. Anther dome-shaped; pollinia 4.

Flowering : November – February; Fruiting: January – March.

Specimen cited : Lava forest 1900 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1031**, dt. 26. 12. 2009.

Status : Rare.

Local distribution : Neora Valley, Tangta forest, Senchale, Gumbadara, 900 – 2500 m.

General distribution : India (Sikkim, West Bengal); China, Myanmar, Nepal and Thailand.

Sunipia Lindl.

Plant small perennial epiphytic herb. Pseudobulbs obovoid. Leaf solitary, coriaceous, oblong-elliptic, obtuse. Inflorescence basal, erect, racemes, laxly to densely solitary to many-flowered; floral bracts prominent. Flowers distichous, small to medium-sized, (flowers concealed by the concave bracts). Sepals subsimilar; dorsal sepal free; lateral pair free or variously connate. Petals much smaller than sepals, margins entire to lacerate. Lip simple, entire, fleshy at apex, ecallose or with an obscure fleshy callus. Column fleshy; foot variable. Anther turned away from the rostellum; pollinia 4.

The genus *Sunipia* Lindl., comprises about 3 species distributed from Nepal eastwards through North and North East Thailand and China to Vietnam.

Key to the species

1. Inflorescence longer than leaves.....2
 - 1a. Inflorescence shorter than leaves3
2. Flowers more than 2 cm long, translucent-white, tinged with deep purple.....*S. cirrhata*
 - 2a. Flowers less than 1 cm long, pale-green, tinged with purple..... *S. scariosa*
3. Flowers 4-8; flowers less than 1 cm long, whitish-purple.....*S. bicolor*
 - 3a. Flower solitary or 2; flowers more than 1 cm long, pale-green.....*S. intermedia*

Sunipia bicolor Lindl., Gen. Sp. Orchid. Pl.: 179. 1833; Pradhan, Indian Orch. Guide Identif. Cult. 2: 485. 1979; Deva & Naithani, Orch. N.W. Himal. 421. t. 418. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 652. 1998; Bose *et al.* Orch. India. 437. 1999.

Ione bicolor (Lindl.) Lindl., Fol. Orchid. Ione 2: 3, no.6. 1853; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Bruhl, Guide Orch. Sikkim. 207. 1926; Tuyama in Hara, Fl. E. Himal. 1: 440. 1966; Tuyama in Hara, Fl. E. Himal. 2: 190. 1971; Pearce & Cribb, Fl. Bhutan, 3(3): 481 & 483, t. 482. 2002; Lucksom, Orch. Sikkim N.E. Himal. 777-778. t. 785, pl. 34. 2007; Misra, Orch. India. 304. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1536. 2012; *et Pleione.* 8(2): 475 – 477. 2014.

Dipodium khasianum Griff., Itin. Pl. Khasyah Mts.: 84, no.1219. 1848.

Ione khasiana (Griff.) Lindl., Fol. Orchid. Ione 2: 2, no.5. 1853.

Bulbophyllum bicolor (Lindl.) Hook. f., Fl. Brit. India 5(2): 770. 1890. [Fig. 4.30]

Plant epiphytic herb, 6-11 cm tall. Pseudobulbs 1.6-1.9 × 0.7-1 cm, obpyriform or flask-shaped, narrowed to apex, base broad. Leaf solitary, 5-10 × 0.6-1 cm, linear-oblong, obliquely emarginated at tip, keeled beneath, petiolate. Inflorescences solitary or 2, shorter than leaves, laxly 4 to 8-flowered; peduncle 1.5-2.5 cm long; rachis 2.3-3.8 cm long, glabrous; pedicellate-ovary 2.5-3 mm long. Flowers 7-10 mm across, whitish purple; floral bracts lanceolate. Dorsal sepal 6-8 × 1.8-2.3 mm, lanceolate, acute; lateral pair 7-8.5 × 1.7-2.3 mm, lanceolate, acute, connivent, apices free, diverging. Petals 2.8-3 × 1.4-1.8 mm, ovate to elliptic, acute to subacute. Lip 4.5-5 × 3.5-4 mm, dark purple, pandurate to broadly fusiform; base truncate, 2 auriculate, expanded centrally, broadly ovate, margins deeply serrate, narrowed to an oblong, obtuse, emarginated apex. Column 0.7-1 mm long; foot very short. Anther cordate; pollinia 4.

Flowering : October – December; Fruiting: November – January.
 Specimen cited : Rimbick 2000 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0131**, dt. 22. 10. 2007.
 Status : Frequent.
 Local distribution : Lava, Takdah, Dowhill, Algarah, Kafer, 1500–2000m.
 General distribution : India (North West India, Arunachal Pradesh, Meghalaya, Nagaland); China, Bhutan, Myanmar and Thailand.

Sunipia cirrhata (Lindl.) P.F. Hunt, Kew Bull. 26(1): 184. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 484. 1979; Bose *et al.* Orch. India. 437. 1999.

Ione cirrhata Lindl., Fol. Orchid. Ione 2: 1, no.1. 1853; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pearce & Cribb, Fl. Bhutan, 3(3): 483-484. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 178-179. 2005; *et* 100 N.E. Indian Orch. 164-165. 2006; Lucksom, Orch. Sikkim N.E. Himal. 777. t. 784, pl. 34. 2007; Misra, Orch. India. 304. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* Pleione. 8(2): 475 – 477. 2014.

Ione virens Lindl., Fol. Orchid. Ione 2: 1, no.2. 1853.

I. fuscopurpurea Lindl., *op. cit.* 2, no.3. 1853.

I. paleacea Lindl., *op. cit.* no.4. 1853; Bruhl, Guide Orch. Sikkim. 208. 1926.

Bulbophyllum cirrhatum (Lindl.) Hook. f., Fl. Brit. India 5(2): 758. 1890.

B. paleaceum (Lindl.) Hook. f., *op. cit.* 1890.

B. mishmeense Hook. f., *op. cit.* 769. 1890.

B. virens (Lindl.) Hook. f., *op. cit.* 770. 1890.

S. fuscopurpurea (Lindl.) P.F. Hunt, *op. cit.* 1971.

S. paleacea (Lindl.) P.F. Hunt, *op. cit.* 1971.

S. virens (Lindl.) P.F. Hunt, *op. cit.* 185. 1971. [Plate 4.26. B]

Plant epiphytic herb, 13-19 cm tall. Pseudobulbs 2-3.5 × 1.4-1.8 cm, ovoid-conical to obpyriform, rugose. Leaf solitary, 12-15.5 × 2.2-3.2 cm, erect, oblong to oblanceolate, obtuse, petiolate. Inflorescence longer than leaves, laxly 3 to 7-flowered; peduncle 11-19 cm long, slender, sheathed; rachis 4.5-5.7 cm long; pedicellate-ovary 1.3-1.6 cm long. Flowers 2.1-2.7 cm long, pendent, translucent white tinged with deep purple; floral bracts lanceolate. Dorsal sepal 1.4-2.1 × 0.5-0.6 cm, lanceolate, acuminate; lateral pair 1.5-2.3 × 0.7-0.9 cm, adnate to tip of column foot, connivent to just below the tip. Petals 0.3-0.4 × 0.1-0.14 cm, broadly ovate, obtuse, oblique, margins erose. Lip 1.6-1.9 × 0.5-0.8 cm, simple, purple, pendent, lanceolate, acuminate; disc 2-lamellate. Column stout; foot shortly attenuate. Anther cap with 2 long projections.

Flowering : October–November; Fruiting: November–December.

Specimen cited : Damsang Gari 1900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0738**, dt. 17. 11. 2008.
 Status : Sparse.
 Local distribution : Algarah, Lopchu, Takdah, Kuwapani-Lava, Rambh forest, 1600 – 1900 m.
 General distribution : India (Arunachal Pradesh, Meghalaya, Sikkim and West Bengal); Bhutan, China and Myanmar.

Sunipia intermedia (King & Pantl.) P.F. Hunt, Kew Bull. 26(1): 184. 1971; Hedge & A.N. Rao, Indian J. Forestry 10(3): 196. 1987; Pradhan, Indian Orch. Guide Identif. Cult. 2: 484. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 652-655. 1998; Bose *et al.* Orch. India. 437. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 486 & 488. 2002; Lucksom, Orch. Sikkim N.E. Himal. 775. t. 781. 2007; Misra, Orch. India. 317. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1548. 2012.

Ione intermedia King & Pantl., J. Asiat. Soc. Bengal 65(2): 120. 1896; Bruhl, Guide Orch. Sikkim. 207. 1926.

Plant epiphytic herb, 3.5-5.4 cm tall. Pseudobulbs 6-9 × 5-7 mm, ovoid to narrowly ovoid. Leaf solitary, 2-5 × 0.4-0.6 cm, linear, tip emarginated, petiolate. Inflorescence shorter than leaves, solitary or 2-flowered; peduncle 1-1.3 cm long, glabrous; pedicellate-ovary 3-6 mm long, glabrous. Flowers 1-1.3 cm across, pale green; floral bracts lanceolate. Dorsal sepal 6-8 × 0.7-1 mm, lanceolate, acute, spreading; lateral pair 6-8 × 1.5-2 mm, lanceolate, acute, connivent at tips only. Petals 4.5-6 × 0.6-1 mm, linear, twisted, base dilated, concave, margins denticulate. Lip 3.5-5 mm long, lanceolate; apex caudate-acuminate, margins entire; base dilated, sub-auriculate, truncately clawed. Column 1 mm long, winged. Anther suberect; pollinia 4.

Flowering : April – June; Fruiting: May – July.
 Specimen cited : Dow Hill- Kurseong 1600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0341**, dt. 28. 04. 2008.
 Status : Rare.
 Local distribution : Lava, Lungshel, Kafer, Lava, Chimney-Kurseong, 1300 – 2000 m.
 General distribution : India (Sikkim).

Sunipia scariosa Lindl., Gen. Sp. Orchid. Pl.: 179. 1833; Hook. f., Fl. Brit. India 5: 772. 1890; Bruhl, Guide Orch. Sikkim. 208. 1926; Banerji, Orch. Nepal. 110. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 655. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 488, t. 487. 2002; Lucksom, Orch. Sikkim N.E. Himal. 775-776. t. 782, pl. 34. 2007; Misra, Orch. India. 317. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1548. 2012.

Ione scariosa (Lindl.) King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 161, t.219. 1898.

I. siamensis Rolfe, Bull. Misc. Inform. Kew 1908: 413. 1908.

I. scariosa var. *magnibracteata* Kerr, J. Siam Soc., Nat. Hist. Suppl. 9(2): 237. 1933.

Sunipia racemosa sensu Tang & Wang, Acta. Phytotax. Sin. 1(1): 90. 1951; Pradhan, Indian Orch. Guide Identif. Cult. 2: 483. 1979; Bose *et al.* Orch. India. 439. 1999.

Ione racemosa sensu Seidenf., Bot. Tidsskr. 64: 227. 1969.

Plant epiphytic herb, 18-34 cm tall. Pseudobulbs 2.4-3 × 0.8-1.9 cm, ovoid. Leaf solitary, 10-14 × 1.5-2.2 cm, linear-oblong, obtuse, emarginated, keeled beneath, petiolate. Inflorescence longer than leaves, laxly 15 to 25-flowered; peduncle 11-25 cm long, slender, sheathed; rachis 6-11 cm long, deflexed, slightly zigzag; pedicellate-ovary 2-2.8 mm long. Flowers 6-8 mm long, pale-green, tinged with purple; floral bracts ovate. Dorsal sepal 3.8-5 × 2.5-2.9 mm, ovate, obtuse, concave; lateral pair 5-7 × 1.5-1.7 mm, parallel to one another, oblong-lanceolate, acute, incurved. Petals 2.5-2.7 × 1.7-2 mm, broadly ovate, obtuse, subretuse, margins erose-denticulate, base truncate. Lip 4-4.7 × 1.5-2 mm, fleshy, sessile, ovate-elliptic, obtuse, concave; disc with a short, oblong callus under the column. Column 0.9-1 mm tall. Anther suberect; pollinia 4.

Flowering	: April – July; Fruiting: June – August.
Specimen cited	: Lakpatar 1900 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0855 , dt. 13. 05. 2009.
Status	: Rare.
Local distribution	: Todey, Takdah, Munsong, Dabaipani-Takdah, 1000 – 1900 m.
General distribution	: India (North East India, Sikkim, West Bengal); China, Myanmar, Nepal, Thailand and Vietnam.

Subfamily **Vandoideae** Endlicher

Tribe **Vandae** Lindl.

Subtribe **Aeridinae** Pfitz.

Acampe Lindl.

Plant perennial epiphytic herb, monopodial. Stem simple or branched, stout. Leaves coriaceous, distichous, tip emarginated or 2-lobed. Inflorescence axillary; stout, racemes, corymbose, or paniculate; floral bracts persistent. Flowers non-resupinate,

fleshy. Sepals and petals similar; lateral sepals adnate to the spur. Lip saccate or with a short spur, adnate to the column, immobile, rigid, variously lobed, fleshy, papillose, tuberculate or warty, sometimes dentate. Column short, glabrous or papillose; stielidia 2, toothed-like. Anther ovate, apiculate; pollinia 4.

The genus *Acampe* Lindl., comprises about 10 species distributed in South East Asia, tropical and subtropical Africa, Madagascar and the Islands of the Western Indian Ocean.

Key to the species

1. Leaves more than 3.5 cm broad;
inflorescence subcorymbose; lip white spotted with red.....*A. rigida*
- 1a. Leaves less than 2.8 cm broad;
inflorescence subumbellate; lip white..... *A. carinata*

Acampe carinata (Griff.) Panigr., Taxon 34(4): 688. 1985; Misra, Orch. Odisha. 342-343. 2014.

Acampe papillosa (Lindl.) Lindl., Fol. Orch. *Acampe* 4:2, no.5. 1853; Chowdhery, Orch. Fl. Arun. Pradh. 41. 1998; Tuyama in Hara, Fl. E. Himal. 2: 176. 1971; Banerji, Orch. Nepal. 112. 1982; Deva & Naithani, Orch. N.W. Himal. 344 – 346. t. 345. 1986; Pradhan, Indian Orch. 2: 523 – 524-525. 1979; Bose *et al.* Orch. India. 75. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 491, t. 490. 2002; M. Pradhan, 100 N.E. Indian Orch. 168-169. 2006; Lucksom, Orch. Sikkim N.E. Himal. 807-808. t. 821, pl. 35. 2007; Misra, Orch. India. 280. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 452. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 82. 2013.

Saccolabium papillosum Lindl., Bot. Reg. 18: t. 1552. 1833; Hook. f., Fl. Brit. India 6: 63. 1890; King & Pantl., Ann. Roy. Bot. Gard. Calcutta 8: 219, t. 290. 1898; Bruhl, Guide Orch. Sikkim. 132. 1926.

S. carinatum Griff., Not. Pl. Asiat. 3: 354. 1851.

Gastrochilus papillosum (Lindl.) Kuntze., Revis. Gen. pl. 2: 661. 1891.

Sarcanthus papillosus (Lindl.) Tixier, Bull. Soc. Roy. Sci. Nat. Laos 9: 30. 1963. [Plate 4.26. C]

Epiphytic herb, 26-55 cm tall. Stem 29-54 × 0.7-0.9 cm, stout, branched. Leaves many, 8-12 × 1.8-2.8 cm, coriaceous, oblong, emerginate at tip, sessile. Inflorescence 2.6-3.4 cm long, racemes, clustered to subumbellate, densely 6 to 9-flowered; pedicellate-ovary 6-7 mm long. Flowers 0.9-1.2 cm across; pale green with brown streaks; floral bracts minute. Sepals similar, dorsal sepal 5-7 × 1.8-2.2 mm, oblong-elliptic to oblong, obtuse; lateral pair 6.5-6.9 × 1.8-2.1 mm, obliquely elliptic, obtuse, spreading. Petals 5.5-6 × 1.4-1.8 mm, narrowly linear-spatulate, obtuse. Lip 5-7 × 3.5-4 mm, 3-lobed, whitish with dark-purple spots; side lobes

obscurely triangular, erect; apical lobe ovate, margins erose; spur conical, hairy. Column 1-1.2 mm long. Anther pale yellow; pollinia 2.

Flowering : September – January; Fruiting: November – April.
Specimen cited : Najoke forest 500m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0709**, dt. 21. 09. 2008.
Status : Common.
Local distribution : Relli, Rambli, Kalijhora, Kurseong, Sevoke, Teesta 27th mile Hydro Electric Power Project sides, Malli, Sepkhola, 150 – 900 m.
General distribution : India (North West Himalaya, North Est India, West Bengal); Bangladesh, Bhutan, Laos, Myanmar, Nepal, Thailand and Vietnam.

Acampe rigida (Buch.-Ham. ex J.E. Sm.) P.F. Hunt, Kew Bull. 24:98. 1970; Pradhan, Indian Orch. Guide Identif. Cult. 2: 524. 1979; Deva & Naithani, Orch. N.W. Himal. 346. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 41. 1998; Bose *et al.* Orch. India. 75. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 491-492. 2002; Lucksom, Orch. Sikkim N.E. Himal. 806-807. t. 819, pl. 35. 2007; Misra, Orch. India. 280. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 452. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; *et* Indian Forest. 140(7): 730 – 732. 2014; Chowdhery & Agrawala, A Century W.H. Orch. 84. 2013; Misra, Orch. Odisha. 346-347. 2014.

Aerides rigida Buch.-Ham. ex J.E. Sm., Rees, Cycl. (Addenda) 39: Aerides no. 12. 1819; Hook. f., Fl. Brit. India 6: 48. 1890.

Vanda longifolia Lindl., Gen. Sp. Orchid. 215. 1833.

Acampe longifolia (Lindl.) Lindl., Fol. Orchid. Acampe 1. 1853; Banerji, Orch. Nepal. 111. 1982.

Acampe intermedia Rchb. f., Allg. Gartenzeitung 24: 217. 1856.

A. wightiana var. *longepedunculata* Trimen, Syst. Cat. Fl. Pl. Ceylon 90. 1885.

Saccolabium longifolium (Lindl.) Hook. f., Fl. Brit. India 6(1): 62. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 220, t. 292. 1898; Bruhl, Guide Orch. Sikkim. 132. 1926.

Plant epiphytic herb, 63-95 cm long. Stem erect, unbranched or branched, sheathed. Leaves many, 14-34 × 3.5-4.6 cm, distichous, fleshy-coriaceous, conduplicate, curved, linear-oblong, tip unequally 2-lobed. Inflorescence axillary, sub-corymbose, densely 7 to 10-flowered; pedicellate-ovary 1-1.2 cm long. Flowers 1.5-1.8 cm across, fleshy, yellowish-green with red-brown strips; floral bracts minute. Sepals 0.9-1.3 × 0.6-0.8 cm, subsimilar, free, obovate-elliptic, tip obtuse. Petals 0.8-1.1 × 0.4-0.5 cm, oblong-oblongate, falcate, obtuse. Lip 0.7-0.8 × 0.4-0.5 cm, white spotted with red, saccate, obscurely 3-lobed; side lobes rounded, erect; apical lobe ovate, rounded; disc fleshy; spur short. Column stout, foot short. Anther conical; pollinia 2.

Flowering	: May – June; Fruiting: June – October.
Specimen cited	: Najoke forest 500 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0050 , dt. 21. 05. 2007.
Status	: Common.
Local distribution	: Teesta River sides, Fyangtar, Tarkhola forest, Pareng, 160 – 1200 m.
General distribution	: India (North Est India and West Bengal); Nepal, Bhutan, Myanmar, Thailand, Cambodia, Vietnam and Malaysia.

Aerides Lour.

Plants perennial epiphytic herbs, monopodial. Stem stout. Leaves linear, coriaceous, tip 2-lobed. Inflorescence racemose or paniculate, pendent, many-flowered. Flowers in decurved racemes. Sepals and petals broad, spreading; lateral pair adnate to the column foot. Lip 3-lobed, spurred; side lobes decurrent on the column, apical lobe larger than the side lobes, or smaller often erose; spur forward-curving. Column elongate, often broadened at apex; foot short; rostellum bifid. Anther 2-celled; pollinia 2.

The genus *Aerides* Lour., comprises 19 species distributed from Sri Lanka, India, Nepal, Bhutan, Myanmar, China, Thailand, Indo-China, and Malaysia to the Philippines and Indonesia.

Key to the species

1. Lip apical lobe narrow,
turning upwards; spur prominent *A. odorata*
- 1a. Lip apical lobe cordate, forward pointing; spur short *A. multiflora*

Aerides multiflora Roxb., Pl. Coromandel 3: 67, t.271. 1820; Hook. f., Fl. Brit. India 6: 44. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 212, t. 283. 1898; Bruhl, Guide Orch. Sikkim. 127. 1926; Tuyama in Hara, Fl. E. Himal. 1: 425. 1966; Tuyama in Hara, Fl. E. Himal. 2: 177. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 546. 1979; Banerji, Orch. Nepal. 112-113. 1982; Deva & Naithani, Orch. N.W. Himal. 347. t. 348-349. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 28. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 49. 1998; Bose *et al.* Orch. India. 81. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 493 & 495, t. 494. 2002; M. Pradhan, 100 N.E. Indian Orch. 170-171. 2006; Lucksom, Orch. Sikkim N.E. Himal. 871. t. 880, pl. 38. 2007; Misra, Orch. India. 280. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4):

452. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 86. 2013; Misra, Orch. Odisha. 358-359. 2014.

Aerides affine Lindl., Gen. Sp. Orchid. Pl.: 239. 1833.

Epidendrum geniculatum sensu Buch.-Ham. *ex* Hook. f., Fl. Brit. India 6(1): 45. 1890.

Plant epiphytic herb, 22-35 cm long. Stem sheathed. Leaves 6-9, 8-26 × 1.5-2.7 cm, distichous, oblong, tip 2-lobed, deeply channeled above, keeled beneath. Inflorescence 1-2, 20-29 cm long, racemes or paniculate, densely many-flowered; pedicellate-ovary 0.6-0.8 cm long. Flowers 1.3-2.2 cm across, fragrant, white flushed with pinkish or purple; floral bracts ovate. Sepals 0.8-1 × 0.5-0.7 cm, similar, oblong to orbicular, rounded; lateral pair 0.8-1 × 0.6-0.7 cm, decurrent on the column foot. Petals 0.9-1.2 × 0.5-0.6 cm, elliptic-oblong, obtuse. Lip 1.3-1.6 × 0.8-1.2 cm, 3-lobed, clawed, margins recurved; side lobes erect, semi-circular; apical lobe cordate, rounded, slightly convex above; callus at base of apical lobe, fleshy, incurved, 2-lobed; spur short. Column apex beaked, base winged. Anther depressed, ovate; pollinia 2.

Flowering : March – June; Fruiting: May – September.
Specimen cited : Samalbung Busty 500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0318**, dt. 20. 04. 2008.
Status : Rare.
Local distribution : Suruk, Samthar busty, Siliguri, Mungpoo, Seokbir khani, Sittong, 150 – 1200 m.
General distribution : India (North West Himalaya, North Est India, West Bengal); Bangladesh, Bhutan, Laos, Myanmar, Thailand, Malaysia.

Aerides odorata Lour., Fl. Cochinch. 2: 525. 1790; Hook. f., Fl. Brit. India 6: 47. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 212, t.282. 1898; Hedge, J. Bombay Nat. Hist. Soc. 82 (2): 117. 1985; Bruhl, Guide Orch. Sikkim. 127. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 549. 1979; Banerji, Orch. Nepal. 113. 1982; Deva & Naithani, Orch. N.W. Himal. 347-351. t. 350. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 29. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 74. 1998; Bose *et al.* Orch. India. 81. 1999; Pearce *et* Cribb, Fl. Bhutan, 3(3): 493. 2002; M. Pradhan, 100 N.E. Indian Orch. 172-173. 2006; Lucksom, Orch. Sikkim N.E. Himal. 870-871. t. 879, pl. 38. 2007; Misra, Orch. India. 280. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 452. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 88. 2013; Misra, Orch. Odisha. 360-361. 2014.

Epedendrum odoratum (Lour.) Poiret, Lamarck, Encycl. Suppl. 1: 385. 1810.

Aerides cornutum Roxb., Hort. Bengal: 63 1814; Fl. Ind. ed. 1832, 3: 472. 1832.

Orxera cornuta (Roxb.) Rafinesque, Fl. Tellur. 4: 37. 1836.

Plant epiphytic herb, 20-55 cm long. Stem stout, pendent, branched. Leaves 6-11, 9-19 × 2.7-4.3 cm, oblong, tip round-lobed, incurved, distichous. Inflorescences 1-3, pendent, racemes, densely many-flowered; pedicellate-ovary 1.6-2.2 cm long. Flowers 1.7-2.4 cm across, white with purplish shade; floral bracts lanceolate. Dorsal sepal 0.9-1.2 × 0.6-0.8 cm, oblong, obtuse; lateral pair 0.9-1.2 × 0.8-1 cm, triangular-lanceolate, decurrent on the column foot. Petals 0.9-1.1 × 0.5-0.7 cm, oblong, obtuse. Lip 1.1-1.3 × 0.4-0.6 cm, 3-lobed, almost enclosing the column, adnate to the column foot, spurred, fleshy; side lobes erect, margins entire to dentate; apical lobe narrow, incurved, margins entire to erose; disc with 2 small keels; spur prominent. Column 2-3 mm long; foot short. Anther beaked; pollinia 2.

Flowering : May – July; Fruiting: July – September.

Specimen cited : Bagrakot 500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0844**, dt. 07. 05. 2009.

Status : Rare.

Local distribution : Sukuna, Kurseong, Malli, Solok, Mungpoo, Leshkhola, 150 – 700 m.

General distribution : India (North West Himalaya, North East India, Sikkim, West Bengal); Bhutan, Borneo, Laos, Malaysia, Myanmar, Nepal, Philippines, Sumatra and Vietnam.

Ascocentrum Schltr.

Plants perennial epiphytic herb. Leaves distichous, overlapping, tip unequally 2-lobed. Inflorescence erect to spreading, many-flowered. Flowers small, (less than 2.5 cm across), opening widely. Sepals and petals similar. Lip 3-lobed, adnate to base of the column and slightly joined to it at the base of the side lobes, spurred; apical lobe oblong, decurved; spur lacking keels or septa but with a small thickening in the mouth at the base of the apical lobe. Column short, foot absent; pollinia 2.

The genus *Ascocentrum* Schltr., comprises 5 species distributed from the Himalayas to South East Asia, China, Taiwan, Java and the Philippines.

Ascocentrum ampullaceum (Roxb.) Schltr., Fedde, Repert. Spec. Nov. Regni Veg. Beih. 1: 975. 1913; Pradhan, Indian Orch. Guide Identif. Cult. 2: 560. 1979; Deva & Naithani, Orch. N.W. Himal. 351. t. 352. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 36. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 74-75. 1998; Bose *et al.* Orch. India. 101. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 498 & 500, t. 499. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 182-183. 2005; Lucksom, Orch. Sikkim N.E. Himal. 887-888. t. 899, pl. 39. 2007; Misra, Orch. India. 281. 2007; Yonzone *et al.*

Asian J. Pharm. Lif. Sci., 1(4): 452. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1536. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 96. 2013.

Aerides ampullaceal Roxb., Fl. Ind. ed. 1832, 3: 476. 1832.

Saccolabium ampullaceum (Roxb.) Lindl., Sert. Orchid. 4: t.17. 1838; Hook. f., Fl. Brit. India 6: 64. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 220, t. 293. 1898; Bruhl, Guide Orch. Sikkim. 132. 1926.

Angraecum campyloplectron Rchb. f., Bonplandia 3: 226. 1855.

Gastrochilus ampullaceus (Roxb.) Kuntze, Revis. Gen. Pl. 2: 661. 1891.

Ascocentrum ampullaceum var. *aurantiacum* Pradhan, Indian Orch.: Guide Identify. Cult. 2: 561. 1979. [Plate 4.26. D]

Plant epiphytic small herb, 10-18 cm tall. Stem 2-3.4 cm long, unbranched, sheathed. Leaves 5-10, 6-13 × 1.7-2 cm, distichous, overlapping, oblong, tip unequally 2-lobed, jointed. Inflorescence erect, subsessile, shorter than the leaves, axillary, 7 to 15-flowered; pedicellate-ovary, 0.8-1.2 cm long. Flowers 1.5-1.9 cm across, dark pinkish-red; floral bracts minute. Sepals 0.5-0.8 × 0.4-0.5 cm, similar, elliptic-obovate, rounded. Petals 0.6-0.8 × 0.4-0.5 cm, elliptic-obovate, rounded. Lip 0.6-0.7 × 0.2-0.3 cm, spurred, oblong, deflexed, apex rounded; spur slightly curved, slightly inflated at apex. Column 2-2.7 mm long, stout. Anther beaked; pollinia 2.

Flowering	: March – May; Fruiting: May – June.
Specimen cited	: Rambli 500 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0248 , dt. 19. 03. 2008.
Status	: Sparse.
Local distribution	: Kalijhora, Kumsi, Sevoke, 27 th Mile, Najoke, Mungpoo, Pankhabari forest, Pareng, 150 – 900 m.
General distribution	: India (North East India, North West India, Sikkim, West Bengal); Andaman; Bhutan, China, Laos, Myanmar, Nepal, Thailand.

Biermannia King & Pantl.

Plant epiphytic herb. Stem very short. Leaves 3-5, fleshy, linear, tip unequally 2-lobed. Inflorescence short, racemes. Flowers small, resupinate. Sepals subequal, ovate-lanceolate; lateral pair attached to the base of the column. Petals shorter than the sepals. Lip sessile, attached at right angles to the foot of the column, concave, fleshy, the disc with two or more calli. Column with a short foot. Anther depressed, apiculate; pollinia 2.

The genus *Biermannia* King & Pantling, comprises about 9 species distributed in India, Thailand, Peninsular Malaysia, Sumatra, Java, Bali and Borneo.

Biermannia bimaculata (King & Pantl.) King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 200, t.267. 1898; Bruhl, Guide Orch. Sikkim. 120. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 539. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 78. 1998; Bose *et al.* Orch. India. 103. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 501, t. 502. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 184-185. 2005; Lucksom, Orch. Sikkim N.E. Himal. 885. t. 894, pl. 38. 2007; Misra, Orch. India. 282. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 453. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1536. 2012.

Sarcochilus bimaculatus King & Pantl., J. Asiat. Soc. Bengal 64(3): 340. 1896.

Plant epiphytic herb, 5-9 cm tall. Stem sheathed. Leaves 3-5, 3.4-8 × 1.1-1.5 cm, linear-oblong, slightly falcate, tip obliquely 2-lobed, sessile. Inflorescence 3-5, 2 or 3-flowered; peduncle 0.8-1 cm long; pedicellate-ovary 4-5 mm long. Flowers 0.8-1.3 cm across, white with two brown blotches on the lip callus; floral bracts broad. Sepals 0.8-1 × 0.3-0.4 cm, subsimilar, ovate-lanceolate, apiculate; lateral pair attached to column foot. Petals 0.7-0.8 × 0.3-0.4 cm, ovate, subacute. Lip 0.6-0.7 × 0.2-0.3 cm, 3-lobed; side lobes narrow, elongate, falcate, erect, acuminate; apical lobe triangular, fleshy; disc with 2 elongate basal calluses and 2 flat calluses at base of apical lobe. Column 1.5-2.4 mm tall; foot short. Anther white; pollinia oval.

Flowering	: April – July; Fruiting: June – August.
Specimen cited	: Bagrakote 290 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 9290 , dt. 20. 04. 2010.
Status	: Rare.
Local distribution	: Teesta Bridge Sides, Kalijhora, Sepkhola, Leshkhola, 300 – 700 m.
General distribution	: India (North East India, Sikkim, West Bengal).

Chiloschista Lindl.

Plant epiphytic usually stemless; roots flat, scabrid, green. Inflorescence racemes. Flowers yellow spotted with red. Sepals and petals subequal; lateral pair and petals often adnate to column foot. Lip clawed, pouched or spurred, 3-lobed; side lobes large, erect; apical lobe small; disc with a finger like callus, hirsute-hairy. Column short; semiterete; foot long; clinandrium shallow; stigma deep-set; rostellum deflexed, bifid. Anther cap with 2 long-filiform setae; pollinia 4.

The genus *Chiloschista* Lindl., comprises about 10 species distributed from the Indian subcontinent through South East Asia and Australia.

Chiloschista parishii Seidenf., Opera Bot. 95: 176, t.109. 1988; Hook. f., Fl. Brit. India 5: 857. 1890; Chowdhery, Orch. Fl. Arun. Pradh. 194. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 503. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 186-187. 2005; Lucksom, Orch. Sikkim N.E. Himal. 788. t. 797, pl. 34. 2007; Misra, Orch. India. 287. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538. 2012; Misra, Orch. Odisha. 322-323. 2014.

Thrixspermum luniferum sensu Rchb. f., Trans. Linn. Soc. London 30: 136. 1874, *non* Rchb. f. 1868.

Sarcochilus luniferus Auct. non Reichb. f.: Benth. *ex* Hook. f., Curtis, Bot. Mag. T. 7044. 1889; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 207. 1898; Bruhl, Guide Orch. Sikkim. 124. 1926.

Chilichista lunifera (Hook. f.) J.J. Sm. Pradhan, Indian Orch. Guide Identif. Cult. 2: 505. 1979; Banerji, Orch. Nepal. 113. 1982; Bose *et al.* Orch. India. 146. 1999.

Plant epiphytic. Inflorescence pendent, hairy, laxly many-flowered; peduncle 1.6-2.7 cm long, sheathed, hirsute; rachis 2.3-9 cm long, softly hirsute; pedicellate-ovary 2.7-3 mm long, hairy. Flowers 1.3-1.5 cm across, subsessile, yellow spotted with brown to red; floral bracts membranous. Dorsal sepals 5-8 × 4-4.7 mm, ovate, obtuse, concave, hirsute externally; lateral pair 5-7.7 × 4-4.8 mm, ovate-orbicular, obtuse, spreading, hirsute externally. Petals 5.6-7.1 × 4-4.3 mm, subquadrate, truncate, outer surface hirsute. Lip 5.2-7 × 6.6-8.8 mm, yellow, 3-lobed, deeply saccate, adnate to column foot; side lobes large, erect, obliquely oblong, glabrous; apical lobe knob like, reduced. Column 1-1.3 mm long, thick; foot short. Anther cap filiform; pollinia 4.

Flowering	: March – May; Fruiting: April – June.
Specimen cited	: Sukuna forest 350 m, Rajendra Yonzon, D. Lama and R. B. Bhujel 0203 , dt. 07. 03. 2008.
Status	: Rare.
Local distribution	: Sepkhola, Najoke forest, Chisang-Godok, Samthar, 200 – 1400 m.
General distribution	: India (North East India, Sikkim); Myanmar, Nepal.

Note: Intraspecific floral colour variation in *Chiloschista parishii* Seidenf. [Plate 4.18]

Morphologically both studied specimens look alike but after proper study, a distinct light redish dots were found on outer side of the frontal surface of lip sac. This colour variation is an intraspecific character in natural population of *Chiloschista parishii* Seidenf., which may have occurred because of ecological conditions.

An intraspecific variation in the lower half of the outer surface of frontal lip sac possess light redish spots as in sepals and petals where distinct reddish dotted blotch was observed whereas in type species that the outer surface of frontal sac of lip is

absolutely colourless (variation occurred portion of outer surface of frontal sac of lip sac is bounded by circle). A and A1 are type species and B and B2 are intraspecific variation occurred within the species.

Morphologically both A and B are look alike but after drawing of lip, a distinct light reddish dots examined on the outer side of the frontal surface of lip sac in species B and B1. The literature was surveyed to find reference on such variation reported by earlier worker but there is none. It seems that this is the first time such observation has been made. It is an intraspecific variation on the natural population of *Chiloschista parishii* Seidenf. It may be due to environmental effects on the plant.

Cleisocentron Bruhl

Plants epiphytic herb, monopodial. Stems pendent. Leaves oblong, terete, tip unequally 2-lobed to acute. Inflorescence supra-axillary, racemes, short, few to many-flowered. Sepals and petals spreading. Lip immobile, 3-lobed; spur gently curved, cylindrical, containing either an upward-pointing, central protuberance on the back wall or a decurved, shelf-like back wall callus, front wall callus flap like, median septum absent. Column erect, cylindrical; stipes long, slender; viscidium large; pollinia 4.

The genus *Cleisocentron* Bruhl., comprises about 5 species distributed from Sikkim, Bhutan, Myanmar and Vietnam to Borneo.

Cleisocentron pallens (Cathcart ex Lindl.) Pearce & Cribb, Edinb. J. Bot. 58(1): 118. 2001; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Pearce & Cribb, Fl. Bhutan, 3(3): 505 & 507, t. 506. 2002; M. Pradhan, 100 N.E. Indian Orch. 178-179. 2006; Lucksom, Orch. Sikkim N.E. Himal. 787. t. 796, pl. 34. 2007; Misra, Orch. India. 287. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538-1539. 2012.

Saccolabium pallens Cathcart ex Lindl., J. Proc. Linn. Soc., Bot. 3(9): 35. 1858.

S. trichromum Rchb. f., Hamburger Garten-Blumenzeitung 15: 51. 1859; Hook. f., Fl. Brit. India 6: 65. 1890; King & Pantl., Orch. Sikkim Himal. 229, t. 306. 1898.

Cleisocentron trichromum (Rchb. f.) Bruhl, Guide Orch. Sikkim: 137. 1926; Chowdhery, Orch. Fl. Arun. Pradh. 199. 1998; Pradhan & Pradhan, 100 Beaut. Orch. 47. 1997; Bose *et al.* Orch. India. 150. 1999. [Plate 4.27. A]

Plant epiphytic herb, 34-96 cm long. Stem branched, sheathed. Leaves 9-12, 9-17 × 1.4-2 cm, narrowly oblong, tip obliquely bifid, sessile. Inflorescence divergent, second, few-flowered; peduncle 1-1.5 cm long; rachis 3.7-6.9 cm long, glabrous; pedicellate-ovary 1.8-2.4 × 0.2 cm long. Flowers 2.4-2.8 cm across, pale suffused with purple; floral bracts obtuse. Sepals 7-8 × 2-2.8 mm, subsimilar, narrowly

oblong, subacute; lateral pair 8-9 × 2-2.8 mm, oblong-lanceolate, acute. Petals 6-7 × 3.2 mm, obovate-oblong, apiculate. Lip 1.4-1.7 × 0.2-0.4 cm, 3-lobed, adnate to the column foot, spurred; side lobes triangular; apical lobe short, concave, acute, entire; spur funnel shaped. Column 3-3.8 mm long; column foot curved. Anther beaked, white; pollinia 2.

Flowering : July – September; Fruiting: August – October.
 Specimen cited : Kalijhora forest 500 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0676**, dt. 15. 08. 2008.
 Status : Threatened.
 Local distribution : Najoke forest, Solok, Samsing, Mangmaya, 300–700 m.
 General distribution : India (Sikkim, West Bengal and Arunachal Pradesh).

Cleisostoma Bl.

Plant perennial epiphytic herb. Stems erect or pendulous. Leaves coriaceous of fleshy, dorsiventrally flattened or terete, tip 2-lobed or acute. Inflorescence leaf opposed, racemes or paniculate, erect, horizontal or pendent, few to many-flowered. Flowers small, bracteate. Sepals and petals subequal, free, spreading. Lip 3-lobed, base with a large saccate or infundibuliform spur, spur longitudinally septate. Column short and stout, foot lacking; pollinia 4.

The genus *Cleisostoma* Bl., comprises about 100 species distributed from Sri Lanka, India, South East Asia, Indonesia, New Guinea, the Philippines and the Pacific Islands to Australia.

Key to the species

1. Leaves terete *C. filiforme*
- 1a. Leaves flattened.....2
2. Leaves acute or acuminate at tip;
 inflorescence shorter than the leaves *C. subulatum*
- 2a. Leaves truncate or 2-lobed at tip;
 inflorescence longer than the leaves.....3
3. Lip longer than the sepals; spur septate *C. racemiferum*
- 3a. Lip as long as the sepals; spur not septate *C. aspersum*

Cleisostoma aspersum (Rchb. f.) Garay, Bot. Mus. Leafl. 23(4): 169. 1972; Pradhan, Indian Orch. Guide Identif. Cult. 2: 516. 1979; Deva & Naithani, Orch. N.W. Himal. 353. t. 355. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 200. 1998; Bose *et al.* Orch. India. 152. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 508. 2002; Lucksom, Orch. Sikkim N.E. Himal. 813-814. t. 829, pl. 36. 2007; Misra, Orch. India. 287. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012.

Sarcanthus aspersus Rchb. f., Hamburger Garten-Blumenzeitung 21: 297. 1865.

Cleisostoma bicuspidatum Hook. f., Fl. Brit. India 6(1): 75. 1890.

Cleisostoma parishii Seidenf. & Arora, Nord. J. Bot. 2(1): 11. 1982. Non. (Hook. f.) Garay.

Stereochilus bicuspidatum (Hook. f.) King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 236, t.314. 1898; Bruhl, Guide Orch. Sikkim. 140. 1926.

Sarcanthus bicuspidatus (Hook. f.) J.J. Sm., Natuurk. Tijdschr. Ned. Indie. 72: 84. 1912.

S. khasiaensis Tang & Wang, Acta Phytotax. Sin. 1(1): 98. 1951, *nom. alt.* [Fig. 4.31]

Plant epiphytic herb, 10-22 cm tall. Stem sheathed. Leaves 4-6, 5-13 × 0.7-1.2 cm, subflabellate, coriaceous, oblong, tip obliquely 2-lobed, acute. Inflorescence longer than the leaves, subdensely many-flowered; peduncle 5-9 cm; rachis 3-14 cm long; pedicellate-ovary 2-3 mm long, glabrous. Flowers 0.6-0.7 cm across, yellowish marked with pink along midrib of sepals and petals and lobes of lip; floral bracts minute. Dorsal sepal 2.8-4 × 1.2-2.7 mm, obovate-elliptic, obtuse; lateral pair 2.7-4 × 1.5-2.3 mm, elliptic, obtuse. Petals 2.8-3.7 × 1-1.5 mm, oblanceolate, obtuse. Lip 0.3-0.4 cm long, 3-lobed, adnate to the column, spurred; side lobes triangular, obtuse; apical lobe ovate, concave, acute; base with 2 calluses; spur prominent. Column 1-1.5 mm tall. Anther cordate; pollinia 4.

Flowering : June – August; Fruiting: July – September.

Specimen cited : Panighatta 260 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 9290**, dt. 20. 07. 2010.

Status : Rare.

Local distribution : Samsing, Suruk, Yangmakum, Guling forest, 300 – 1900 m.

General distribution : India (Assam, Meghalaya, Sikkim); Bhutan, Myanmar.

Cleisostoma filiforme (Lindl.) Garay, Bot. Mus. Leafl. 23(4): 171. 1972; Bruhl, Guide Orch. Sikkim. 142. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 509. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 204. 1998; Bose *et al.* Orch. India. 152. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 513-514. 2002; Lucksom, Orch. Sikkim N.E. Himal. 816. t. 833, pl. 36. 2007; Misra, Orch. India. 288. 2007; Yonzone *et al.*

Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1538. 2012.

Sarcanthus filiformis Lindl., Bot. Reg. 28 : misc.61, no.69. 1842; Hook. f., Fl. Brit. India 6: 66. 1890 (*non* Wight, 1851); King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 240, t. 319. 1898.

Plant epiphytic herb, pendent, 28-65 cm long. Stem sheathed. Leaves 6-9, 13-25 × 0.2-0.3 cm, terete, tip subacute, sessile. Inflorescence lateral, axillary, leaf-opposed, racemes, laxly 9 to 23-flowered; peduncle 3 cm long, glabrous, sheathed; rachis 11 cm long, glabrous; pedicellate-ovary 5-7 mm long, glabrous. Flowers 0.6-0.7 cm across, purple with a central yellow stripe; floral bracts minute, triangular. Dorsal sepal 2-3 × 0.9-1.6 mm, hooded, ovate, obtuse; lateral pair 3.7-4 × 1.7-1.8 mm, spreading, ovate-elliptic, subacute. Petals 2.7-3 × 0.7-0.9 mm, spreading, narrowly oblong-lanceolate, acute. Lip 4.4-5.1 mm long, white, 3-lobed, spurred; hypochile saccate-spurred, side lobes rounded to obscurely 2-lobed; epichile deflexed, ovate-lanceolate, apex acute, with 2 basal triangular projections; spur cylindrical, base broad. Column 1-1.5 × 0.8-1 mm. Anther beaked; pollinia 2.

Flowering : July – August; Fruiting: August – October.

Specimen cited : Relli forest near Sepkhola 600 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0570**, dt. 26. 07. 2008.

Status : Common.

Local distribution : Najoke, Kalijhora forest, Mungpoo, Chisang-Godok, 200 – 1600 m.

General distribution : India (North East India, Sikkim); Bhutan, Myanmar, Cambodia, Laos, Thailand and Vietnam.

Cleisostoma racemiferum (Lindl.) Garay, Bot. Mus. Leaf. 23(4): 173. 1972; Pradhan, Indian Orch. Guide Identif. Cult. 2: 515-516. 1979; Hedge, Orch. Arun. Pradh. 73. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 204-208. 1998; Bose *et al.* Orch. India. 154. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 511. 2002; Lucksom, Orch. Sikkim N.E. Himal. 814. t. 830, pl. 36. 2007; Misra, Orch. India. 288. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1539. 2012.

Saccolabium racemiferum Lindl., Gen. Sp. Orchid. Pl.: 224. 1833.

Sarcanthus pallidus Lindl., Bot. Reg. 26: misc.78, no. 185. 1840; Hook. f., Fl. Brit. India 6: 68. 1890; King & Pantl., Orch. Sikkim Himal. 241, t. 320. 1898; Bruhl, Guide Orch. Sikkim. 142. 1926.

S. racemifer (Lindl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 891. 1861.

S. yunnanensis Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 4: 77. 1919. [Plate 4.27. B]

Plant epiphytic herb, 20-35 cm tall. Stem sheathed. Leaves 5-9, 15-31 × 2.5-3.5 cm, oblong, coriaceous, tip unequally 2-lobed, lobules broadly rounded, sessile, jointed. Inflorescence lateral, 14-19 cm, leaf-opposite, paniculate, laxly many-flowered; peduncle 11-19 cm long, sheathed, glabrous; rachis 10-19 cm long; pedicellate-ovary 0.3-1 cm long. Flowers 0.7-0.8 cm across, brownish-black, edged with yellow; floral bracts minute. Dorsal sepal 3-4.2 × 1-2.4 mm, elliptic, rounded, spreading; lateral pair 3-4.1 × 1-2.2 mm, oblique, obtuse, spreading. Petals 3-3.6 × 1.2-1.6 mm, elliptic, rounded. Lip 3.5-5.5 mm long, longer than the sepals, 3-lobed, yellowish, fleshy, spurred; side lobes obliquely triangular, acuminate; apical lobe incurved; back wall callus rounded, 2-lobed, papillose; spur septate. Column 2 mm tall, stout. Anther beaked; pollinia 2.

- Flowering : July – September; Fruiting: August – October.
 Specimen cited : Nockdara Busty 1900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0671**, dt. 13. 08. 2008.
 Status : Rare.
 Local distribution : Lungshel, Labdah, Mungpoo, Sangsay Bhalukhop, 800 – 2200 m.
 General distribution : India (Arunachal Pradesh, Assam, Meghalaya, Sikkim); Bhutan, Burma, Laos, Nepal, Thailand, Myanmar and Vietnam.

Cleisostoma subulatum Bl., Bijdr.: 363. 1825; Pradhan, Indian Orch. Guide Identif. Cult. 2: 514-515. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 208. 1998; Bose *et al.* Orch. India. 154. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 511-512. 2002; Lucksom, Orch. Sikkim N.E. Himal. 813. t. 828, pl. 35. 2007; Misra, Orch. India. 288. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 455. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1539. 2012.

Sarcanthus secundus Griff., Not. Pl. Asiat. 3: 362. 1851; Hook. f., Fl. Brit. India 6: 67. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 241, t. 321. 1898; Bruhl, Guide Orch. Sikkim. 143. 1926.

Sarcanthus subulatus (Bl.) Rchb. f., Bonplandia 5: 41. 1957.

Saccolabium secundum (Griff.) Ridl., Mat. Fl. Malay. Penins. 1: 168. 1907.

Plant epiphytic herb, pendent. Stem slender, compressed, sheathed. Leaves 9-15, 8.5-16 × 0.8-1.1 cm, distichous, fleshy, oblong-lanceolate, 1-ribbed beneath, acute, jointed, sheathed. Inflorescence shorter than the leaves, leaf-opposed, pendent, racemes, laxly 7 to 18-flowered; peduncle 1-2 cm long; rachis 3-6 cm long, glabrous; pedicellate-ovary 4-5 mm long, glabrous. Flowers 5-7 mm across, scentless, pale yellow with intra-marginal bands of brown; floral bracts minute, ovate. Sepals similar, 4-5 × 1.7-2 mm, ovate-elliptic, subacute, spreading. Petals 3-4 × 1-1.4 mm, obovate-oblong, obtuse, spreading. Lip 5-6 mm long, white with purple apical lobe, adnate to the column-base, saccate-spurred; hypochile with 2 short,

suborbicular side lobes; epichile oblong, acute; spur funnel shaped. Column very short, stout. Anther beaked; pollinia 2.

- Flowering : July – August; Fruiting: July – September.
Specimen cited : Kalijhora forest 350 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0658**, dt. 13.08. 2008.
Status : Threatened.
Local distribution : Najoke forest, Nimbong, Solok-Kalimpong, 250 – 900 m.
General distribution : India (Assam, Arunachal Pradesh, Meghalaya, Nagaland, Sikkim); Bhutan, Cambodia, Indonesia, Malaysia, Myanmar, Philippines and Thailand.

Esmeralda Rchb. f.

Plants perennial, epiphytic herbs. Stem stout, terete, scandent. Leaves coriaceous, distichous, tip unequally 2-lobed. Inflorescence extra axillary, racemose, erect, few-flowered; floral bracts persistent. Flowers showy, (5-8.5 cm across), transversely streaked. Sepals and petals similar, spreading, petals smaller than the sepals. Lip mobile, 3-lobed, pendent, shorter than the sepals and petals; side lobes small; apical lobe reniform, margin crenate; disc 2-callose. Column stout. Anther terminal; pollinia 4.

The genus *Esmeralda* Rchb. f., comprises 2 species occurring in the Himalaya, Myanmar, South China and Thailand.

Key to the species

1. Sepals oblong-obovate or sub-round;
sepals and petals white and broad, rounded
apically; flowering March - June..... *E. cathcartii*
- 1a. Sepals narrowly oblong-lanceolate;
sepals and petals yellow and narrow somewhat
pointed apically; flowering September - December..... *E. clarkei*

Esmeralda cathcartii (Lindl.) Rchb. f., Xenia. Orchid. 2: 39. 1874; Chowdhery, Orch. Fl. Arun. Pradh. 387-390. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 517, t. 518. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 188-189. 2005; & 100 N.E. Indian Orch. 182-183. 2006; Lucksom, Orch. Sikkim N.E. Himal. 837. t. 852, pl. 36. 2007; Misra, Orch. India. 298. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1542. 2012.

Vanda cathcartii Lindl., Fol. Orchid. Vanda 4: 8, no.17. 1853.

Arachnanthe cathcartii (Lindl.) Benth. & Hook. f., Gen. Pl. 3: 573. 1883; Hook. f., Fl. Brit. India 6: 27. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 208, t. 278. 1898; Bruhl, Guide Orch. Sikkim. 125. 1926.

Arachnis cathcartii (Lindl.) J.J. Sm., Natuurk. Tijdschr. Ned.-Indie. 72:75. 1912; Pradhan, Indian Orch. Guide Identif. Cult. 2: 499-500. 1979; Pradhan & Pradhan, 100 Beaut. Orch. 33. 1997; Bose *et al.* Orch. India. 99. 1999. [Plate 4.19]

Plant epiphytic herb. Stem 46-86 cm long, pendent. Leaves 8-13, 11.5-23 × 2.8-4.7 cm, oblong-elliptic, tip unequally 2-lobed, obtuse. Inflorescence 9-16 cm long, 2 to 4-flowered; peduncle 3.5-9 cm long, glabrous; rachis 9-14 cm long, glabrous; pedicellate-ovary 2.3-3.1 cm long. Flowers 5.5-7 cm across, fleshy; white externally, internally chocolate-brown, finely striped with yellow; floral bracts broadly oblong. Dorsal sepal 3.4-4.4 × 2-2.5 cm, oblong, obtuse, narrowed at base; lateral pair 3.2-3.8 × 1.8-2.4 cm, oblong-elliptic, slightly falcate, obtuse, narrowed at base. Petals 2.9-3.5 × 2-2.5 cm, elliptic, obtuse, narrowed at base. Lip 1.6-1.9 × 0.8-1.1 cm, whitish-yellow, 4-lobed, clawed at base, oblong; hypochile transversely oblong, with upturned side lobes; apical lobe ovate, obtuse, fleshy; disc 3 to 5-ridged. Column 1.6-1.9 × 0.6-0.8 cm, stout, expanded at base. Anther cap conical; pollinia 4.

Flowering : March – June; Fruiting: May – July.

Specimen Cited : Neora Valley 2200 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1067**, dt. 08. 03. 2010.

Status : Rare.

Local distribution : Sukiapokhari, Lava, 700 – 2300 m.

General distribution : India (North East India, Sikkim, West Bengal).

Esmeralda clarkei Rchb. f., Gard. Chron. n.s. 26: 552. 1886; Seidenf., Nord. Joun. Bot. 2: 216. 1982; Banerji, Orch. Nepal. 115. 1982; Chowdhery, Orch. Fl. Arun. Pradh. 390. 1998; Bose *et al.* Orch. India. 244. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 517 & 519. 2002; M. Pradhan, 100 N.E. Indian Orch. 184-185. 2006; Lucksom, Orch. Sikkim N.E. Himal. 837-838. t. 853, pl. 37. 2007; Misra, Orch. India. 298. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1542. 2012.

Vanda clarkei (Rchb. f.) N.E. Brown, Bull. Misc. Inform. Kew 1888: 112. 1888.

Arachranthe clarkei (Rchb. f.) Rolfe, Gard. Chron. ser.3, 4: 567. 1888; Hook. f., Fl. Brit. India 6: 28. 1890; Bruhl, Guide Orch. Sikkim. 126. 1926.

Arachnis clarkei (Rchb. f.) J.J. Sm., Natuurk. Tijdschr. Ned.-Indie. 72: 73. 1912; Pradhan, Indian Orch. Guide Identif. Cult. 2: 500. 1979.

Plant epiphytic herb, 45-135 cm tall. Stem sheathed. Leaves 7-14, 9-21 × 2.4-3.6 cm, coriaceous, oblong, tip unequally 2-lobed, margins undulate, jointed. Inflorescence erect, 3 or 4-flowered; peduncle 4-6 cm long, glabrous; rachis 10-16 cm long, glabrous; pedicellate-ovary 3.4-4.1 × 0.4-0.6 cm. Flowers 5.8-8.5 cm across; pale-

green, transversely streaked with red; floral bracts ovate. Dorsal sepal 4.1-4.7 × 1-1.3 cm, erect, oblong-lanceolate, obtuse; lateral pair 3.4-3.9 × 1-1.3 cm, falcate, oblong-lanceolate, base cuneate. Petals 3.5-4.2 × 0.8-1 cm, falcate, oblong to subspathulate, obtuse. Lip 1.8-2.7 × 1-1.2 cm, pendent, 3-lobed; side lobes with 2 auricles; mesochile narrow; epichile brown-red, reniform, margins crenulate; disc with 7-9 radiating keels and 2 raised calluses. Column 0.9-1.2 cm long, stout, clavate. Anther conical; pollinia 4.

Flowering	: September–December; Fruiting: November–January.
Specimen cited	: Lava forest 2000 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0753 , dt. 14. 12. 2008.
Status	: Rare.
Local distribution	: Todey, Algarah, Damsang Gari, Chimney-Kurseong, 1400 – 2000 m.
General distribution	: India (North East India, Sikkim, West Bengal); Bhutan, China, Myanmar, Nepal.

Gastrochilus D. Don

Plants perennial epiphytic herb. Leaves coriaceous, distichous, acute. Inflorescence axillary, short, few-flowered; peduncle short; rachis short. Flowers fleshy, conspicuous. Sepals and petals similar, spreading. Lip adnate to column base; hypochile globose, saccate, sides adnate to the column wings; epichile broad, rounded, flat, sometimes hairy to fimbriate. Column very short, stout; pollinia 2.

The genus *Gastrochilus* D. Don, comprises about 20 species distributed in India, Nepal, South East Asia, Malaysia and the adjacent Islands.

Key to the species

1. Stem 4-15 cm long, terete or laterally compressed, erect or pendulous, leaves 3-8, 3-15 cm long, terete or flattened.....2
- 1a. Stem 13-32 cm long, pendulous, with several distichously, leaves 1.8-3 cm long, leaf tip minutely 2-3 dented or 2-3, needle-like projections.....5
2. Leaves terete..... *G. inconspicuus*
- 2a. Leaves flattened.....3
3. Upper surface of epichile papillose.....4
- 3a. Upper surface of epichile smooth; sepals and petals bright red..... *G. dasypogon*

4. Stem elongate; leaves acute..... *G. acutifolius*
 4a. Stem reduced; leaves emarginated *G. calceolaris*
5. Epichile of lip with 2 small, conical calli;
 flowering March-May..... *G. distichus*
- 5a. Epichile of lip rhombic, tip emarginated or
 with a minute apiculate tip, margin entire;
 flowering November-December..... *G. sonamii*

Gastrochilus acutifolius (Lindl.) Kuntze, Revis. Gen. Pl. 2: 661. 1891; Pradhan, Indian Orch. Guide Identif. Cult. 2: 558. 1979; Hedge, Orch. Arun. Pradh. 74. 1984; Deva & Naithani, Orch. N.W. Himal. 387. t. 386. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 86. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 410. 1998; Bose *et al.* Orch. India. 259. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 520. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 190-191. 2005; Lucksom, Orch. Sikkim N.E. Himal. 889-890. t. 901, pl. 39. 2007; Misra, Orch. India. 300. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1542. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 214. 2013.

Aerides umbellatum Wall., Lindl., Gen. Sp. Orchid. Pl.: 223. 1833.

Saccolabium acutifolium Lindl., Gen. Spl. Orchid. Pl.: 223. 1833; Hook. f., Fl. Brit. India 6: 61. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 226, t. 302. 1898; Bruhl, Guide Orch. Sikkim. 134. 1926.

S. denticulatum Paxt., Paxton's Mag. Bot. 7: 145 + fig. 1840.

S. dentatum Rchb. f., Walpers, Ann. Bot. Syst. 6: 883. 1864.

Plant epiphytic herb, 8-24 cm tall. Stem slender, erect, slightly zigzag. Leaves 7-9, 8-14 × 2-3.5 cm, distichous, linear-lanceolate, coriaceous, acute, jointed. Inflorescence 1-3, corymbose, densely 8 to 10-flowered; peduncle 3-4.5 cm long, sheathed; pedicellate-ovary 1.7-2 cm long. Flowers 1.8-2.4 cm across, fleshy; sepals and petals yellow, yellowish-red to yellowish-green, spotted or mottled with brown; floral bracts minute, oblong. Sepals similar, 0.9-1.2 × 0.4-0.6 cm, oblong, obtuse. Petals 0.9-1.1 × 0.3-0.4 cm, narrowly obovate-oblong, obtuse. Lip 0.6-0.8 × 0.8-1 cm, white with a yellow centre, speckled with red, subglobose; hypochile saccate; side lobes narrow, obscure; epichile triangular-reniform, 3-lobed, margins fimbriate with glandular hairs. Column 0.7-1.5 mm long. Anther dome shaped; pollinia 2.

Flowering : October – December; Fruiting: November – January.
 Specimen cited : Kafer forest 2000 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1017**, dt. 05. 11. 2009.
 Status : Rare.
 Local distribution : Baggonra, Rambi forest, 1400 – 2400 m.
 General distribution : India (North East India, West Bengal); Bhutan, Nepal.

Gastrochilus calceolaris (Buch.-Ham. ex J.E. Sm.) D. Don, Prodr. Fl. Nepal.: 32. 1825; Tuyama in Hara, Fl. E. Himal. 1: 435. 1966; Tuyama in Hara, Fl. E. Himal. 2: 187. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 557. 1979; Banerji, Orch. Nepal. 116. 1982; Hedge, Orch. Arun. Pradh. 74. 1984; Deva & Naithani, Orch. N.W. Himal. 387–389. t. 388. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 413. 1998; Bose *et al.* Orch. India. 259. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 520-521. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 192-193. 2005; Lucksom, Orch. Sikkim N.E. Himal. 890. t. 902, pl. 39. 2007; Misra, Orch. India. 300. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1542. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 216. 2013.

Aerides calceolaris Buch.-Ham. ex J.E. Sm., Rees, Cycl.(Addenda): 39: *Aerides*, no.11. 1819.

Epidendrum calceolare Buch.-Ham., D. Don, Prodr. Fl. Nepal.: 32. 1825.

Sarcochilus nepalensis Spreng., Syst. Veg. ed.16(3): 721. 1826.

Saccolabium calceolare (Buch.-Ham. ex J.E. Sm.) Lindl., Gen. Sp. Orchid. Pl.: 223. 1833; Hook. f., Fl. Brit. India 6: 60. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 225, t. 300. 1898; Bruhl, Guide Orch. Sikkim. 134. 1926.

Aerides leopardinum Wall. ex Lindl., Sert. Orchid. (frontispiece): 6. 1838.

A. leopardorum Wall., Hook. f., Fl. Brit. India 6(1): 60. 1890.

Plant epiphytic herb, pendent, 9-21 cm tall. Stem sheathed. Leaves 3-7, 7-20 × 1.5-3.2 cm, distichous, falcate, linear-lanceolate, tip acute, unequally emarginated. Inflorescence short, corymbose to subracemes, shorter than the leaves, 5 to 8-flowered; peduncle 2.6-3 cm long, glabrous, sheathed; pedicellate-ovary glabrous. Flowers 1-1.8 cm across, pale-green speckled with brownish purple; floral bracts ovate. Sepals similar, narrowly elliptic, rounded. Dorsal sepal 6-9 × 3-4.8 mm; lateral pair 7-10 × 3-4.7 mm. Petals 6-8 × 3-4 mm, subspathulate, obtuse. Lip 7-10 × 6-7.5 mm, white or yellow, speckled with red, sessile; hypochile saccate-globose; epichile reniform, margin denticulate; disc echinate. Column 1.6-2.4 mm tall, fleshy. Anther cordate, beaked; pollinia 2.

Flowering : March – June; Fruiting: May – July.

Specimen cited : Ramam forest 2250 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0451**, dt. 28. 05. 2008.

Status : Rare.

Local distribution : Toroyok busty, Mamring, Takdah, Rambi forest, Toroyok, 1700 – 2300 m.

General distribution : India (Himalayas), Nepal, Myanmar, China, Thailand, Vietnam to Malaysia.

Gastrochilus dasypogon (J.E. Sm.) Kuntze, Revis. Gen. Pl.: 661. 1891; Pradhan, Indian Orch. Guide Identif. Cult. 2: 557. 1979; Hedge, Orch. Arun. Pradh. 75. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 87. 1997; Chowdhery, Orch. Fl. Arun. Pradh.

413. 1998; Bose *et al.* Orch. India. 259. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 521. 2002; Lucksom, Orch. Sikkim N.E. Himal. 891. pl. 39. 2007; Misra, Orch. India. 300. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1542. 2012.

Aerides dasypogon J.E. Sm., Rees, Cycl. (Addenda) 39: *Aerides*, no.10. 1819.

Saccolabium dasypogon (J.E. Sm.) Lindl., Gen. Sp. Orchid. Pl.: 222. 1833; Hook. f., Fl. Brit. India 6: 66. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 224, t. 299. 1898; Bruhl, Guide Orch. Sikkim. 133. 1926.

Plant epiphytic herb, 9-14 cm tall. Stem pendulous. Leaves 4-5, 6-16 × 2-3.4 cm, alternate, broadly ovate, fleshy, tip acute, unequally 3-toothed, margins revolute. Inflorescence 3-5 cm long, corymbose to umbel, densely 4 to 10-flowered, base sheathing; peduncle 1-2.8 × 0.5-0.6 cm, terete, ebracteate, glabrous; rachis 0.4-1 cm long; pedicellate-ovary 0.8-1.1 cm long, shallowly ribbed. Flowers 1.9-2.2 cm across, red inside and green outside, spotted with violet; floral bracts ovate. Sepals and petals red. Sepals similar, 0.8-0.9 × 0.2-0.3 cm, obovate, concave, obtuse. Petals 0.7-0.8 × 0.2-0.3 cm, obovate-elliptic, obtuse. Lip 0.6-0.7 × 0.8-0.9 cm, keeled, globose, epichile smooth, reniform, margins erose, white with a patch of yellow in the centre spotted with red; hypochile globose sac. Column 1.6-2 mm long. Anther depressed; pollinia 2.

Flowering	: October–November; Fruiting: November–December.
Specimen cited	: Panbu Busty 600 m, Rajendra Yonzon, D. Lama and R. B. Bhujel 1511 , dt. 26. 10. 2010.
Status	: Rare.
Local distribution	: Sittong, Pareng, 600 – 1400 m.
General distribution	: India (Sikkim, West Bengal); Bhutan.

Gastrochilus distichus (Lindl.) Kuntze, Revis. Gen. Pl. 2: 661. 1891; Tuyama in Hara, Fl. E. Himal. 1: 435. 1966; Tuyama in Hara, Fl. E. Himal. 2: 187. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 559. 1979; Banerji, Orch. Nepal. 116. 1982; Deva & Naithani, Orch. N.W. Himal. 389. t. 390. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 413-416. 1998; Bose *et al.* Orch. India. 259. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 525-526. 2002; Lucksom, Orch. Sikkim N.E. Himal. 892-893. t. 906. 2007; Misra, Orch. India. 300. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1542-43. 2012.

Saccolabium distichum Lindl., J. Proc. Linn. Soc., Bot. 3: 36. 1859; Hook. f., Fl. Brit. India 6: 64. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 227, t. 303. 1898; Bruhl, Guide Orch. Sikkim. 130. 1926.

Plant epiphytic herb, 13-30 cm long. Stems slender, clustered, pendent, branched. Leaves 27-31, 2.4-3 × 0.5-0.7 cm, distichous, alternate, narrowly lanceolate, fleshy, acuminate, with 2 or 3 needle-like points at tip, sessile. Inflorescence 1.5-2 cm long, racemes, leaf-opposed, 2 to 4-flowered, pendulous; peduncle 1.5-2.5 cm long; rachis

3-4 mm long, sigmoid; pedicellate-ovary 7-9 mm long. Flowers 1.2-1.7 cm across, green with irregular brown or crimson spots; floral bracts minute, oblong. Sepals similar, oblong-elliptic, obtuse; dorsal sepal 3.7-4 × 3-3.5 mm, oblong-elliptic, obtuse; lateral pair 4.5-5.5 × 3-3.5 mm, obovate-lanceolate, subacute. Petals 4-6 × 3-4 mm, oblong-elliptic, obtuse, glabrous. Lip 7-9 × 6-7 mm, simple, adnate to column base, fleshy, semi-circular, margins deflexed, entire, base saccate; disc with 2 blunt, conical calli at base. Column 2-2.5 mm long, broad. Anther ovate with a short beak; pollinia 2.

Flowering : March – May; Fruiting: May – July.
 Specimen cited : Alubari – Neora Valley 2400 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0303**, dt. 11. 04. 2008.
 Status : Rare.
 Local distribution : Today, Rimbick, 1700 – 2600 m.
 General distribution : India (North India, Sikkim, West Bengal); Nepal.

Gastrochilus inconspicuus (Hook. f.) Kuntze, Revis. Gen. Pl. 2: 661. 1891; Pradhan, Indian Orch. Guide Identif. Cult. 2: 556. 1979; Deva & Naithani, Orch. N.W. Himal. 393. t. 391. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 416. 1998; Bose *et al.* Orch. India. 261. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 521-522, t. 523. 2002; Lucksom, Orch. Sikkim N.E. Himal. 889. t. 900, pl. 39. 2007; Misra, Orch. India. 300. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1543. 2012.

Saccolabium inconspicuum Hook. f., Fl. Brit. India 6(1): 56. 1890.

Luisia micrantha Hook. f., *op. cit.* 23. 1890.

Cymbidium inconspicuum Wall. *ex* Hook. f., Fl. Brit. India 6(1): 56. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8(1); 46. 1895.

Luisia inconspicua (Hook. f.) Hook. f. *ex* King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 203, t.272. 1898; Bruhl, Guide Orch. Sikkim. 122. 1926.

Plant epiphytic herb, 20-30 cm tall. Stem terete, flexuous, unbranched or occasionally branched. Leaves 2.8-8.5 × 0.1-0.2 cm, terete, straight to slightly curved, rugose-straiate, dark green, sessile. Inflorescence leaf-opposed, lateral, racemes, 2 to 4-flowered; peduncle short; rachis 1-2 mm long; pedicellate-ovary 3-4 mm long, curved. Flowers 3.5-6 mm across, pale yellowish-green; floral bracts triangular. Dorsal sepals 2-3 × 1-1.3 mm, ovate lanceolate, suboblique, acute, recurved, spreading; lateral pair 3-3.2 × 1-1.3 mm. Petals 2-3 × 1.2-1.4 mm, oblong to ovate-elliptic, acute, spreading. Lip 2-3 × 1.5-2 mm, 3-lobed; hypochile saccate, side lobes rounded; apical lobe flat, decurved, slightly reniform, surface minutely hispid, apex 2-lobed, lobules rounded. Column 1-1.5 mm long, erect. Anther beaked; pollinia yellow.

Flowering : June – July; Fruiting: July – August.

Specimen cited : Sukuna 350 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 9290**, dt. 20. 06. 2009.
 Status : Rare.
 Local distribution : Seokbir khani, Relli forest, Jholung, Sepkhola, 200-660 m.
 General distribution : India (North East India, North West India, Sikkim); Bhutan, India.

Gastrochilus sonamii Lucksom, Orchid Review, Vol. 111, 1253. 278 – 280. 2003; Lucksom, Orch. Sikkim N.E. Himal. 893. t. 908. 2007; Misra, Orch. India. 300. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 460. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1543. 2012; *et* J. Econ. Taxon. Bot. 37(1): 28 – 30. 2013.

Plant epiphytic herb, 25-32 cm long, pendulus. Stem branched. Leaves 1.5-2.5 × 0.3-0.8 cm, distichous, fleshy, lanceolate, acute, sessile. Inflorescence leaf opposed, 3 to 4-flowered; peduncle 1.5-1.9 cm long, terete; rachis 1-7 mm long, terete, glabrous; pedicellate-ovary 0.6-1.4 cm long. Flowers 0.8-1.2 cm across, pale green spotted with dark-purple; floral bracts minute, glabrous. Sepals equal, spreading; dorsal sepal 6-6.5 × 2.8-3.5 mm, obovate, obtuse, concave; lateral pair 6-7 × 2.5-3 mm, oblong-ovate, slightly triangular, subacute. Petals 5-5.6 × 2.8-3 mm, elliptic-ovate, obtuse. Lip 5.9-7 × 4-4.8 mm, 3-lobed, adnate to the column; hypochile conical saccate, spotted with dark-maroon; epichile orbicular-ovate, obtuse with 2-lobes and apiculate tip, margin entire. Column 2-2.2 mm long; rostellum long. Anther ovate, obtuse; pollinia 2.

Flowering : November–December; Fruiting: December– January.
 Specimen cited : Ramam forest 2400 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0740**, dt. 28. 11. 2008.
 Status : Sparse.
 Local distribution : Neora Valley, Manaybhanjang, 1800 – 2600m.
 General distribution : India (Sikkim).

Luisia Gaud.

Plants perennial epiphytic herbs. Stem often branched, woody. Leaves distant, terete, linear. Inflorescence axillary, condensed racemes, subsessile, fewer than 10-flowered; peduncle and rachis attenuate. Flowers small, fleshy. Sepals and petals free, spreading; petals usually longer and narrower than the sepals. Lip fleshy, pendent, immobile; hypochile concave; epichile wrinkled. Column shorter than the lip, stout; rostellum short; stipes short; viscidium short. Anther broad, 2-celled; pollinia 2.

The genus *Luisia* Gaud., comprises about 40 species distributed in Sri Lanka, India, Bhutan, China, Thailand, Indo-China, Japan, Malaysia, Indonesia, New Guinea and the Pacific Islands.

Key to the species

- 1. Lip simple *L. brachystachys*
- 1a. Lip lobed2

- 2. Flowers yellowish-green; epichile broadly cordate.....3
- 2a. Flowers white; epichile subquadrate *L. filiformis*

- 3. Petals oblong; hypochile not saccate at base *L. trichorrhiza*
- 3a. Petals linear-oblong; hypochile saccate at base *L. zeylanica*

Luisia brachystachys (Lindl.) Bl., Rumphia 4: 50. 1849; Hook. f., Fl. Brit. India 6: 23. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 536. 1979; Hedge, Orch. Arun. Pradh. 76. 1984; Deva & Naithani, Orch. N.W. Himal. 399 – 401. t. 397. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 494-495. 1998; Bose *et al.* Orch. India. 323. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 527-528. 2002; Lucksom, Orch. Sikkim N.E. Himal. 886. t. 895. 2007; Misra, Orch. India. 306. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1544. 2012; *et J. Krishi Vigyan.* 1(1): 6-7. 2012; Misra, Orch. Odisha. 336-337. 2014.

Mesoclastes brachystachys Lindl., Gen. Sp. Orchid. Pl.: 45. 1830.

Luisia platyglossa sensu Par., Mason, Burmah: 187. 1883, non Rchb. f.

L. indivisa King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 202. 1898; Bruhl, Guide Orch. Sikkim. 122. 1926.

L. siamensis Rolfe *ex* Downie, Bull. Misc. Inform. Kew 1925: 284. 1925. [Fig. 4.32]

Plant epiphytic herb, clustered, 18-29 cm tall. Stem stout, branched or unbranched. Leaves 6-13 × 0.4-0.5 cm, terete, straight to curved, jointed. Inflorescence 5-7 cm long, leaf-opposed, 4 to 5-flowered; peduncle 1-2 mm long; rachis 4-5 mm long, thick; pedicellate ovary 4-6 mm long. Flowers 3-4 mm long; pale green; floral bracts minute, triangular. Dorsal sepal 3-4.5 × 0.8-1 mm, oblong, obtuse; lateral pair 3-4.5 × 0.8-1 mm, oblong-elliptic, obtuse. Petals 3.5-4.5 × 0.8-1 mm, narrowly oblong-spathulate, falcate, subacute. Lip 3.5-3.8 × 1.5-2 mm, yellow-green to purple, broadly oblong and widened at apex, obtuse; disc ecallose. Column 1.5 mm long; stigma transversely elliptic. Anther subquadrate; pollinia elliptic-oblong.

Flowering : March – May; Fruiting: April – June.

Specimen cited : Mungpoo 1400 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1131**, dt. 14. 04. 2010.

Status : Threatened.
 Local distribution : Mamring busty, Samthar, 1300 – 1900 m.
 General distribution : India (North India, Sikkim, West Bengal);
 Myanmar, Thailand, Laos and Vietnam.

Luisia filiformis Hook. f., Fl. Brit. India 6(1): 23. 1890; S. Mishra, Bull. Bot. Surv. India 22: 154. 1982; Hedge & A.N. Rao, J. Econ. Tax. Bot. 4(2): 387. 1983; Pradhan, Indian Orch. Guide Identif. Cult. 2: 537. 1979; Hedge, Orch. Arun. Pradh. 76. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 93. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 495. 1998; Bose *et al.* Orch. India. 323. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 528. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 196-197. 2005; *et* 100 N.E. Indian Orch. 194-195. 2006; Lucksom, Orch. Sikkim N.E. Himal. 886. t. 896, pl. 39. 2007; Misra, Orch. India. 306. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1544. 2012; *et* J. Krishi Vigyan. 1(1): 7. 2012.

Luisia grovesii Hook. f., Fl. Brit. India 6(1): 25. 1890.

L. volucris sensu King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 204. 1898; Bruhl, Guide Orch. Sikkim. 122. 1926.

L. gamblei Durand, Index Kew. Suppl. 1: 256. 1906. [Plate 4.27. C]

Plant epiphytic herb, 40-95 cm long, pendent. Stem branched, sheathed. Leaves 15-19 × 0.4-0.7 cm, from one side of stem only, linear, terete, rugose, jointed. Inflorescence 4 to 8-flowered; peduncle sheathed; rachis 5-9 mm long; pedicellate-ovary 2-4 mm long. Flowers 3-5 cm across, white; floral bracts minute. Dorsal sepal 5-7 × 1.2-1.4 mm, ovate-elliptic, slightly hooded, subacute, keeled; lateral pair 6-7 × 2-3 mm, spreading, ovate-elliptic, obtuse, keeled. Petals 8-15 × 0.2-0.3 mm, spreading, filiform, obtuse. Lip 4-6 × 1.3-2 mm, 3-lobed, ecallose, dark purple; hypochile broadly triangular to wedge-shaped, margins recurved, side lobes short, rounded; epichile arising from narrowed hypochile, obovate, subquadrate. Column 1.2-1.4 × 1.2-1.5 mm. Anther cap subquadrate; pollinia elliptic-oblong.

Flowering : March – May; Fruiting: April – June.
 Specimen cited : Birik forest 600 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0369**, dt. 12. 05. 2008.
 Status : Rare.
 Local distribution : Kalijhora, Relli, Tindharay, Nimbong, Sittong, Majitar, 300 – 1000 m.
 General distribution : India (North East India, Sikkim, West Bengal);
 Bhutan, Laos, Thailand and Vietnam.

Luisia trichorrhiza (Hook.) Bl., Rumphia 4: 50. 1849; Hook. f., Fl. Brit. India 6: 23. 1890; Bruhl, Guide Orch. Sikkim. 123. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 538. 1979; Banerji, Orch. Nepal. 119. 1982; Hedge, Orch. Arun. Pradh. 76. 1984; Deva & Naithani, Orch. N.W. Himal. 401. t. 398. 1986; Chowdhery, Orch. Fl.

Arun. Pradh. 495. 1998; Bose *et al.* Orch. India. 325. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 528-529. 2002; Lucksom, Orch. Sikkim N.E. Himal. 886-887. t. 897. 2007; Misra, Orch. India. 307. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1544. 2012; *et J. Krishi Vigyan.* 1(1): 7. 2012; Misra, Orch. Odisha. 334-335. 2014.

Vanda trichorrhiza Hook., Exot. Fl. 1:t.72. 1825.

Cymbidium triste sensu Lindl., Gen. Sp. Orchid. Pl.: 167. 1833, non (Forster) Willd.

Plant epiphytic herb, 17-27 cm tall. Stem stout, branched or unbranched, sheathed. Leaves 7-16 × 0.4-0.5 cm, distichous, terete, fleshy, rugose, jointed. Inflorescence leaf-opposed, stout, short, 4 to 6-flowered; peduncle attenuate; rachis 6-8 mm long; pedicellate-ovary 5-7 mm long. Flowers 0.8-1.1 cm across, pale green suffused with purple; floral bracts minute. Dorsal sepal 3.5-5 × 1.5-1.8 mm, oblong, obtuse; lateral pair 5-7 × 2-2.6 mm, spreading, obliquely ovate, acute, keeled. Petals 6-7 × 1.3-1.5 mm, oblong, obtuse, spreading. Lip 6-8 × 4-5.7 mm, 3-lobed, dark purple, hypochile deeply concave; side lobes erect, subacute; epichile cordate, ridged, tapering to subtruncate, apex emarginated. Column 1.8-2.3 mm long, stout. Anther compressed; pollinia 2.

Flowering : March – May; Fruiting: April – June.

Specimen cited : Nimbong forest 1100 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0791**, dt. 22. 03. 2009.

Status : Sparse.

Local distribution : Kumsi, Samalbung, Mungpoo, Nimbong, Seokbir khani, Pudung-Sendaybung, 800 – 1350 m.

General distribution : India (North East India, Sikkim, West Bengal), Bhutan, Myanmar and Thailand.

Luisia zeylanica Lindl., Fol. Orchid. Luisia 4: 3, no.7. 1853; Seidenf., Dansk Bot. Arkiv 27(4): 62. 1971; Bruhl, Guide Orch. Sikkim. 123. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 537. 1979; Deva & Naithani, Orch. N.W. Himal. 401 – 403. t. 400. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 501. 1998; Bose *et al.* Orch. India. 325. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 529, t. 530. 2002; M. Pradhan, 100 N.E. Indian Orch. 196-197. 2006; Lucksom, Orch. Sikkim N.E. Himal. 887. t. 898. 2007; Misra, Orch. India. 307. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et Int. J. Pharm. Life Sci.* 3(3): 1544. 2012; *et J. Krishi Vigyan.* 1(1): 7-8. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 242. 2013.

L. teretefolia Auct non Gaud. Freye. Voy. Aout. Du monde: 427, t.37 1826: Hook. f., Fl. Brit. India 6: 22. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 202, t.271. 1898; Duthie, 140. 1906; Tuyama in Hara, Fl. E. Himal. 1: 443, f. 29. 1966; Tuyama in Hara, Fl. E. Himal. 2: 191. 1971; Banerji, Orch. Nepal. 119. 1982.

Cymbidium tenuifolium Wight Ic. 5(1): t.1689. 1852.

Plant epiphytic herb, 20-34 cm tall. Stem stout, sheathed. Leaves 6-15 × 0.2-0.5 cm, distichous, terete, subacute, sessile. Inflorescence extra-axillary, 2 to 4-flowered; peduncle 2-3 mm long; pedicellate-ovary 4-5 mm long, slender. Flowers 3-6 mm across, pendent; green with purplish brown tinge; floral bracts minute. Dorsal sepal 3.8-5 × 1.7-2.8 mm, ovate, concave; lateral pair 3.7-5 × 2-2.7 mm, lanceolate-ovate, keeled, margins introlled. Petals 4-4.5 × 1.2-1.6 mm, linear-oblong, obtuse. Lip 4-5 × 2.7-3.6 mm, obscurely 3-lobed, dark purple, fleshy; hypochile subquadrate, saccate at base; epichile deflexed, cordate-triangular. Column 1-1.4 mm long, stout. Anther depressed; pollinia 2.

Flowering	: March – May; Fruiting: April – June.
Specimen cited	: Tindharey 600 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0398 , dt. 20. 05. 2008.
Status	: Sparse.
Local distribution	: Kalijhora, Kumsi, Kumai forest, Jholung, Sepkhola, Single, Rangit Valley, 370 – 1000 m.
General distribution	: India (North East India, Sikkim, West Bengal); Sri Lanka.

Micropera Lindl.

Plants small epiphytic herb. Stem sheathed. Leaves linear. Inflorescence lateral, leaf-opposed, racemes. Flowers small, (0.7-2 cm across), non-resupinate, fleshy. Lateral pair connate for a short distance at base. Lip saccate; apex 3-lobed, apical short; spur saccate with a back wall callus, a longitudinal septum and (usually) a 2-lobed, front wall callus. Column variable, usually with a foot; rostellum elongate, slender, twisted unilaterally; stipes linear; viscidium small; pollinia 4.

The genus *Micropera* Lindl., comprises about 15 species distributed from North East India and Indo-China, South to Indonesia, the Philippines, New Guinea, Australia and the Solomon Islands.

Micropera obtusa (Lindl.) Tang & Wang, Acta Phytotax. Sin. 1(1): 94. 1951; Pradhan, Indian Orch. Guide Identif. Cult. 2: 497. 1979; Hedge, Orch. Arun. Pradh. 76-77. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 512. 1998; Bose *et al.* Orch. India. 332. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 531 & 533. 2002; M. Pradhan, 100 N.E. Indian Orch. 198-199. 2006; Lucksom, Orch. Sikkim N.E. Himal. 834-835. t. 849, pl. 36. 2007; Misra, Orch. India. 307. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 461. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1545. 2012.

Camarotis obtusa Lindl., Bot. Reg. 30: misc.73, no.71. 1844; Hook. f., Fl. Brit. India 6: 36. 1890; Chowdhury & Baruah, Ind. Forester 102: 614. 1976; Bruhl, Guide Orch. Sikkim. 141. 1926.

Sarcochilus obtusus (Lindl.) Benth. ex Hook. f., Fl. Brit. India 6(1): 36. 1890.

Camarotis obliquirostris Par. ex King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 238. 1898, pro. Syn. [Fig. 4.33]

Plant epiphytic herb, 13-26 cm tall. Stem erect, sheathed. Leaves 8-10, 6.5-11 × 1-1.4 cm, alternate, linear-oblong, tip obliquely bifid, sessile. Inflorescence 8-13 cm long, arises just opposite to leaf, laxly 8 to 15-flowered; peduncle 0.7-0.9 cm long; rachis 8-14 cm long, ridged; pedicellate-ovary 1-1.3 mm long. Flowers 1.1-1.7 cm across, pale yellow and purplish-white; floral bracts minute. Dorsal sepal 7-9 × 3.5-3.9 mm, reflexed, oblong, margins reflexed; lateral pair 7-7.9 × 3-3.2 mm, oblong, slightly falcate, obtuse, adnate for about a third of their length to the sides of the lip and for the rest connivent under it. Petals 6-6.8 × 3-3.1 mm, oblong, obtuse. Lip 6-7.2 × 3.5-3.8 mm long, yellow, fleshy, adnate to the column base, saccate; side lobes narrow, incurved; epichile minutely 3-lobed. Column c. 0.3 cm long; rostellum long, hooked at apex, twisted. Anther beaked, hooked-apiculate; pollinia 4.

Flowering	: June – August; Fruiting: July – September.
Specimen cited	: Sevoke 300 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0675 , dt. 30. 08. 2008.
Status	: Sparse.
Local distribution	: Birik, Relli-Pala, 27 th Mile, Kumai, Kalijhora, Sepkhola, Pareng, Single, Samsing, Gasok, 200 – 800 m.
General distribution	: India (Sikkim, Arunachal Pradesh); Myanmar and Thailand.

Ornithochilus (Lindl.) Benth.

Plants perennial epiphytic herb, monopodial, without pseudobulb. Stem short. Leaves fleshy. Inflorescence supra-axillary, racemes or paniculate, many-flowered, equaling or exceeding leaves. Flowers small to medium. Sepals and petals free; petals smaller and narrower than the sepals. Lip much longer than the sepals, spurred from distal part of hypochile; side lobe pectinate; epichile 3-lobed, margins ciliate or crenulate. Column short, fleshy; rostellar projection elongate. Anther oblong; pollinia 2.

The genus *Ornithochilus* (Lindl.) Benth., comprises about 3 species distributed from the Indian Himalayas and China, through South East Asia to Malaysia, Sumatra and Borneo.

Ornithochilus difformis (Wall. ex Lindl.) Schltr., Feddes Repert. Spec. Nov. Regni Veg. Beih. 4: 277. 1919; King & Pantl., Orch. Sikkim Himal. 89. 1898; Banerji, Orch. Nepal. 119-120. 1982; Hedge, Orch. Arun. Pradh. 77. 1984; Deva & Naithani, Orch. N.W. Himal. 411 – 413. t. 410. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 555. 1998; Bose *et al.* Orch. India. 361. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 534, t. 535. 2002; Lucksom, Orch. Sikkim N.E. Himal. 793. t. 804, pl. 35. 2007; Misra, Orch. India. 311. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1546. 2012.

Aerides difformis Wall. ex Lindl., Gen. Sp. Orchid. Pl.: 242. 1833.

A. hystrix sensu Lindl., J. Proc. Linn. Soc., Bot. 3: 42. 1858, non (Bl.) Lindl.

Ornithochilus fuscus Lindl., Gen. Sp. Orchid. Pl.: 242. 1833; Hook. f., Fl. Brit. India 6: 76. 1890; Bruhl, Guide Orch. Sikkim. 121. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 551. 1979.

O. eublepharon Hance, J. Bot. 22: 364 1884.

O. delavayi Finet, Bull. Soc. Bot. France 43: 496, t.11. 1896.

Sarcochilus difformis (Wall. ex Lindl.) Tang & Wang, Acta Phytotax. Sin. 1(1): 92. 1951.

Trichoglottis difformis (Wall. ex Lindl.) Ban & Huyen, Fl. Taynguyen: 206. 1984. [Fig. 4.34]

Plant epiphytic herb, pendent, 21-38 cm long. Stem sheathed. Leaves 4-9, 6-18 × 4-6 cm, oblong-elliptic, falcate, acuminate, tip unequally 2-lobed. Inflorescence laxly 12 to 23-flowered; rachis 9-25 cm long, glabrous; pedicellate-ovary 0.9-1.2 cm long. Flowers 0.9-1.1 cm across; pale yellow to green with reddish-purple streaks; floral bracts minute. Dorsal sepal 4.5-5 × 2-3 mm, oblong-elliptic, obtuse, incurved; lateral pair 5-6 × 3-4 mm, spreading, obliquely oblong-ovate, subacute. Petals 7-8 × 1.8-2 mm, linear, obtuse. Lip 8-13 × 5-6 mm, 2-lobed, spurred; hypochile at right-angles to the column with 2 narrowly elliptic, erect side lobe; epichile at right-angles to hypochile, side lobes pectinate; disc with a raised keel; spur decurved. Column 4-5 mm long, cylindric. Anther oblong; pollinia 2.

Flowering : June – August; Fruiting: July – September.

Specimen cited : Lopchu forest 1600 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 0557**, dt. 19. 07. 2008.

Status : Sparse.

Local distribution : Lava, Nokhdara, Kumsi, Relli – Pala, Chimney-Kurseong, Ghoomty Tea Garden; 900 – 2300 m.

General distribution : India (Sikkim, West Bengal); China, Borneo, Eastern Himalaya, Malaysia, Myanmar, Nepal, Sumatra, Thailand and Vietnam.

Papilionanthe Schltr.

Plant perennial epiphytic herb, scrambling, monopodial, erect or pendnt, branched or unbranched. Leaves distichous, terete, fleshy to coriaceous or sheathed at base. Inflorescence axillary, solitary to several-flowered. Flowers large. Sepals and petals spreading, subsimilar, free. Lip 3-lobed, continuous with the column foot, small spur. Column short, fleshy, with a long foot; rostellum elongate; pollinia 2.

The genus *Papilionanthe* Schltr., comprises about 11 species distributed in India, South East Asia and the Malay Archipelago.

Papilionanthe teres (Roxb.) Schltr., Orchis 9: 78, t.12. 1915; Pradhan, Indian Orch. Guide Identif. Cult. 2: 562-563. 1979; Hedge, Orch. Arun. Pradh. 77. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 103. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 570. 1998; Bose *et al.* Orch. India. 374. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 536-537. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 198-199. 2005; *et* 100 N.E. Indian Orch. 200-201. 2006; Lucksom, Orch. Sikkim N.E. Himal. 868. t. 875, pl. 38. 2007; Misra, Orch. India. 311. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1546. 2012; Misra, Orch. Odisha. 326-327. 2014.

Epidendrum subulatum sensu Konig, Retzius, Observ. Bot. 6: 51. 1791, *non* Sw 1788.

Limodorum subulatum (Konig) Willd., Sp. Pl. ed.4(1): 126. 1805.

Dendrobium teres Roxb., Fl. Ind. Ed. 1832, 3: 485. 1832.

Vanda teres sensu Lindl., Gen. Sp. Orchid. Pl.: 217. 1833; Hook. f., Fl. Brit. India 6: 49. 1890; Bruhl, Guide Orch. Sikkim. 128. 1926.

Papilionanthe subulata (Willd.) Garay, Bot. Mus. Leafl. 23(10): 372. 1974.

P. subulata sensu Seidenf., Descry. Epidendr. Konig: 31. 1995, *non* Garay 1874. [Fig. 4.35]

Plant epiphytic herb, scrambling; 60-210 cm long. Stem branched, terete, sheathed. Leaves 7-18 × 0.5-0.8 cm, suberect, curved, terete, linear, ridged, jointed. Inflorescence leaf-opposed, racemes, laxly 3 to 5-flowered; peduncle 5-7.8 cm long, ridged, sheathed; rachis 3.7 cm long, ridged, glabrous; pedicellate-ovary 2.7-3.3 cm long. Flowers 4.6-7.5 cm across; whitish pink; floral bracts ovate. Dorsal sepal 2.5-3.8 × 2.1-3.1 cm, spreading, ovate to sub-rhombic, obtuse, margin undulate; lateral pair 3-3.5 × 1.9-2.5 cm, broadly oblong-ovate, falcate, undulate and slightly twisted. Petals 3-3.8 × 2.8-3.4 cm, suborbicular, rounded, margins undulate, base twisted. Lip 4-4.5 × 3.1-3.9 cm, longer than the sepals, 3-lobed, hairy; side lobes erect, semi-circular; apical lobe flabellate-obcordate, deeply cleft; spur infundibuliform. Column 0.8-0.9 cm long, hairy in front. Anther depressed; pollinia 2.

Flowering

: May – July; Fruiting: June – August.

Specimen cited	: N.B.U. Campus-Siliguri 180 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0491 , dt. 16. 06. 2008.
Status	: Sparse.
Local distribution	: Sevoke, Sukuna, Balasan, Najoke, Kumai, Matigara, Khaprail, Gulma forest, 150 – 700 m.
General distribution	: India (North East India, Sikkim, West Bengal); Bangladesh, Bhutan, China, Myanmar, Nepal, Thailand, Vietnam.

Pelatantheria Lindl.

Plants perennial epiphytic herbs, monopodial. Stem elongate, many noded. Leaves coriaceous, alternate, fleshy, base sheathing, oblong, tip 2-lobed. Inflorescence short, erect, racemes, 2-5 flowered. Sepals and petals similar, free, spreading, greenish-yellow striped with red. Lip 3-lobed, spurred, 10-12 mm long, prominent, fleshy, adnate to the base of the column or of its foot; side lobes small, more or less triangular; apical lobe triangular or hastate. Column stout, short, without foot.

The genus *Pelathatheria* Lindl., comprises about five species distributed in tropical Himalayas South to Sumatra, North to Korea and Japan.

Pelatantheria insectifera (Rchb. f.) Ridl., Journ. Linn. Soc. Bot. 32:376. 1896; Seidenf. 152, fig. 36. 1969; Kataki *et al.* 5:27. 1984; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pradhan, Indian Orch. Guide Identif. Cult. 2: 506. 1979; Deva & Naithani, Orch. N.W. Himal. 413. t. 412. 1986; Bose *et al.* Orch. India. 377. 1999; M. Pradhan, 100 N.E. Indian Orch. 202-203. 2006; Misra, Orch. India. 312. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1546. 2012; Misra, Orch. Odisha. 370-371. 2014.

Sarcanthus insectifer Rchb. f., Bot. Zeit. 15:159. 1857; Hook. f., 6:68. 1890 & 53.t.78. 1895; Duthie, 149. 1906; Haines, 1179. 1924. [Fig. 4.36]

Plant epiphyte herb, stem 18-60 cm, erect, scandent. Leaves many, 2-4 × 1.3-1.8 cm, many, stiff, deeply channeled, oblong, amplexicaul, tip 2-lobed. Inflorescence raceme, 2 to 5-flowered, sub-sessile, 10-12 mm long, shorter than the leaves. Flowers 1.2-1.5 cm across, sepals and petals greenish-yellow striped with red; floral bracts deciduous. Sepals subequal, 6-8 × 4-5 mm, oblong-ovate, obtuse. Petals shorter, narrower, oblong. Lip 10-12 mm long, fleshy, 3-lobed, funnel shaped, side lobes short, rounded, incurved; apical lobe large, triangular-ovate with attenuated

fleshy apex; spur short, infundibuliform, semi-septate. Column short, 2 slender, erect pointed horns; pollinia 2.

- Flowering : August – October; Fruiting: September – November.
Specimen cited : Sevoke forest 300 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1484**, dt. 05. 10. 2010.
Status : Endangered.
Local distribution : Sevoke forest, Gorubathan, 150 – 900 m.
General distribution : Northwest Himalayas, the Deccan Plateau and Northeast India, Nepal, Myanmar, Vietnam and China.

Phalaenopsis Bl.

Plants perennial epiphytic herbs, monopodial, without pseudobulbs. Stem attenuate. Leaves coriaceous, few, oblong to elliptic. Inflorescence solitary to many-flowered, racemes or panicle; peduncle long; rachis sometimes flattened. Flowers large to small, long-lasting, waxy. Sepals and petals similar, widely spreading; petals narrowed at base. Lip 3-lobed; side lobes erect; apical lobe porrect; basal callus bifid or complex, sometimes extended into 2 recurved filiform tails. Column erect, expanded at apex; column foot short. Anther 2-celled; pollinia 2.

The genus *Phalaenopsis* Bl., comprises 40 to 45 species distributed from India to South China, Thailand, Indo-China, Malaysia and Indonesia to the Philippines and New Guinea.

Key to the species

1. Lip spurred2
- 1a. Lip not spurred or saccate.....3
2. Apical lobe of lip as wide as long, apex truncate, emarginated or 2-lobed..... *P. deliciosa*
- 2a. Apical lobe of lip narrow, longer than wide, apex simple.....*P. taenialis*
3. Apical lobe of lip mobile; claw of lip adnate to column foot at a right-angle; sepals and petals white to creamy-white..... *P. lobbii*
- 3a. Apical lobe of lip not mobile; claw of lip continuous with column foot; sepals and petals yellow to green, striped or blotched in maroon-red..... *P. manni*

Phalaenopsis deliciosa Rchb. f., Bonplandia 2: 93. 1854; Pearce & Cribb, Fl. Bhutan, 3(3): 540. 2002; Misra, Orch. India. 313. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011.

subsp. *hookeriana* (Gruss & Rollket) E.A. Christenson, *Phalaenopsis*, A Monograph: 223. 2001; Yonzone *et al.* Int. J. Pharm. Life Sci. 3(3): 1547. 2012.

Doritis wightii sensu Hook. f., Ann. Roy. Bot. Gard. (Calcutta) 5: 39, t.59. 1895.

Doritis wightii (Reichb. f.) Benth., Benth. & Hook. f., Gen. Pl. 3: 574. 1883; Hook. f., Fl. Brit. India 6: 32. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 198, t. 265. 1898; Bruhl, Guide Orch. Sikkim. 120. 1926.

Kingidium deliciosum (Reichb. f.) Sweet, Amer. Orchid Soc. Bull. 39: 1095. 1970; Pradhan, Indian Orch. Guide Identif. Cult. 2: 550. 1979; Hedge, Orch. Arun. Pradh. 75. 1984; Deva & Naithani, Orch. N.W. Himal. 395. t. 394. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 463. 1998; Bose *et al.* Orch. India. 302. 1999; Lucksom, Orch. Sikkim N.E. Himal. 873-874. t. 883. 2007; Misra, Orch. Odisha. 324-325. 2014.

Kingidium hookerianum Gruss & Rollke, Orchidee (Hamburg) 45(6): 230. 1994. [Fig. 4.37]

Plant epiphytic herb. Stem tufted. Leaves 2-3, 7-19 × 2.8-5 cm, obovate-oblong, obtuse, sessile. Inflorescence solitary to many, 7-18 cm long, basal, paniculate or racemes, 5 to 9-flowered; peduncle 7-15 cm tall, terete; rachis 3-5 cm long; pedicel and ovary 0.5-1 cm long. Flowers 0.8-1.2 cm across, pale yellow; floral bracts ovate. Dorsal sepal 6-9 × 1.7-3 mm, narrowly elliptic, subobtuse; lateral pair 4-6 × 2-5 mm, shorter but broader, falcate, obtuse. Petals 5-9 × 3-4 mm, elliptic, rounded, clawed. Lip 0.8-1.2 × 0.5-0.8 cm, 3-lobed, adnate to the foot, white with purple striations and spotting, spreading, slightly saccate at base; side lobes slightly spreading, broader above, wedge-shaped to obovate; apical lobe obcordate, apex deeply cleft; disc with callus. Column 1.5-2 mm long, stout, winged. Anther depressed; pollinia ovoid.

Flowering	: June – August; Fruiting: July – September.
Specimen cited	: Jaldhaka 400 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1237 , dt. 18. 06. 2010.
Status	: Sparse.
Local distribution	: Guling, Lesh khola, Kumai, Sittong, Sepkhola, Pareng, 300 – 800 m.
General distribution	: India (North East India, Sikkim, West Bengal).

Phalaenopsis lobbii (Rchb. f.) H.R. Sweet, Genus *Phalaenopsis*: 53. 1980; Pradhan & Pradhan, 100 Beaut. Orch. 108. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 587-588. 1998; Pearce & Cribb, Fl. Bhutan, 3(3): 542. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 202-203. 2005; Lucksom, Orch. Sikkim N.E. Himal. 872. t. 881, pl. 38. 2007; Misra, Orch. India. 313. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1547. 2012.

Phalaenopsis parishii Reichb. f., Gard. Chron. 410. 1865; Hook. f., Fl. Brit. India 6: 31. 1890; Bruhl, Guide Orch. Sikkim. 119. 1926; Hedge, Orch. Arun. Pradh. 78. 1984; Bose *et al.* Orch. India. 390. 1999.

P. parishii var. *lobbii* Rchb. f., Saunders' Refug. Bot. 2: sub t.85. 1870; Pradhan, Indian Orch. Guide Identif. Cult. 2: 541. 1979.

P. listeri Berkeley, Gard. Chron. ser.3, 1: 280. 1887.

Polychilos lobbii (Rchb. f.) P.S. Shim, Malayan Nat. J. 36(1): 24. 1892.

Plant epiphytic herb, 6-10 cm long. Stem attenuate, sheathed. Leaves 2-5, 4.7-8 × 1.8-4.1 cm, broadly elliptic, tip obliquely notched. Inflorescence shorter than the leaves, suberect, laxly 2 to 7-flowered; pedicellate-ovary 1.6-2.1 cm across. Flowers 1.7-2.1 cm across, white suffuse with light-brown; floral bracts shorter than the ovary. Dorsal sepal 0.8-1 × 0.5-0.6 cm, oblong-elliptic, obtuse; lateral pair 0.7-1 × 0.6-0.8 cm, ovate. Petals 0.7-0.9 × 0.4-0.5 mm, smaller than the sepals, obovate to subspathulate, rounded. Lip 0.6-0.8 × 1.1-1.3 cm, 3-lobed, shortly clawed, mobile, reniform, adnate to the column foot; side lobes erect, acute, keeled; apical lobe concave, apex rounded, appendage at base of apical lobe semi-circular, fleshy, denticulate; disc with 4 filiform segments. Column 0.3-9.5 × 3.3-4.5 mm long, white. Anther white; pollinia yellow.

Flowering	: March – May; Fruiting: April – June.
Specimen cited	: Sukuna 350 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1088 , dt. 22. 03. 2010.
Status	: Rare.
Local distribution	: Tarkhola, Sukuna, 27 th Mile, N.H.P.C. Project sides, Sepkhola, Gasoke, 250 – 700 m.
General distribution	: India (North East India, Sikkim, West Bengal); Myanmar.

Note: Intraspecific floral colour variation in *Phalaenopsis lobbii* (Rchb. f.) H.R. Sweet [Plate 4.20]

Intraspecific variation has been observed in the studied specimen where light colouration blotch on the side lobes of lip was observed. Both specimen A which is a normal species and B is the plant showing variation are closely allied to one another where in specimen A there was light yellow colouration blotch on the side lobes of lip. Specimen B, B1 and B2 are the flowers and lip of type species and A, A1 and A2 are the intraspecific colour variation observed in the studied species.

Phalaenopsis manni Rchb. f., Gard. Chron. 1871: 902. 1971; Gard. Chron. n.s., 5: 503 1876; Hook. f., Fl. Brit. India 6: 30. 1890; Bruhl, Guide Orch. Sikkim. 119. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 542. 1979; Hedge, Orch. Arun. Pradh. 78. 1984; Pradhan & Pradhan, 100 Beaut. Orch. 109. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 587. 1998; Bose *et al.* Orch. India. 390. 1999; Pearce &

Cribb, Fl. Bhutan, 3(3): 542 & 544, t. 543. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 204-205. 2005; *et* 100 N.E. Indian Orch. 204-205. 2006; Lucksom, Orch. Sikkim N.E. Himal. 873. t. 882, pl. 38. 2007; Misra, Orch. India. 313. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1547. 2012.

Phalaenopsis baxallii Rchb. f., Gard. Chron. n.s. 19: 274. 1883.

Polychilos mannii (Rchb. f.) P.S. Shim, Malayan Nat. J. 36(1): 24. 1982.

Plant epiphytic herb, pendent, 18-35 cm long. Stem short, sheathed. Leaves 4 or 5, 10-31 × 3.8-7.3 cm, coriaceous, oblong-lanceolate, obtuse, sessile. Inflorescence 1-4, about as long as the leaves, pendent, laxly 6 to 13-flowered; peduncle and rachis glabrous; pedicellate-ovary slender. Flowers 3.2-4 cm across, pale-green with maroon-red striations; floral bracts ovate-lanceolate. Sepals unequal; dorsal sepal 1.9-2.3 × 0.7-0.8 cm, obovate-oblong, acute, margins revolute, dorsally keeled at apex; lateral pair 2-2.4 × 0.8-1 cm, obliquely ovate-elliptic, apex slightly falcate, acute, margins revolute. Petals 1.5-1.9 × 0.5-0.7 cm, lanceolate to weakly falcate, acute, margins revolute. Lip 1-1.2 × 1-1.1 cm, 3-lobed, yellow to pale cream-white, fleshy, clawed; side lobes subquadrate; apical lobe papillose, apex anchor-shaped, margin erose-dentate. Column 0.7-0.8 mm long, with a short two-horned foot. Anther broad; pollinia 2.

Flowering : April – June; Fruiting: May – July.
Specimen cited : Sukuna forest 250 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0806**, dt. 08. 04. 2009.
Status : Rare.
Local distribution : Najoke, Sittong, Neol forest, 150 – 900 m.
General distribution : India (North East India, Sikkim, West Bengal).

Phalaenopsis taenialis (Lindl.) E.A. Christenson & Pradhan, Selbyana 9: 168. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 34. 1997; Pearce & Cribb, Fl. Bhutan, 3(3): 541-542. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 206-207. 2005; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 462. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1547. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 258. 2013.

Aerides taeniale Lindl., Gen. Sp. Orchid. Pl.: 239. 1833.

A. carnosum Griff., Pl. Asiat. 3: 365. 1851; Icon. Pl. Asiat. 3: t.338A. 1851.

Doritis taenialis (Lindl.) Hook. f., Fl. Brit. India 6(1): 31. 1890; King & Pantl., Orch. Sikkim Himal. 199, t. 166. 1898; Bruhl, Guide Orch. Sikkim. 120. 1926; Banerji, Orch. Nepal. 114-115. 1982.

Kingiella taenialis (Lindl.) Rolfe, Orchid Rev. 25: 197. 1917; Lucksom, Orch. Sikkim N.E. Himal. 874. t. 884, pl. 39. 2007.

Biermannia taenialis (Lindl.) Tang & Wang, Act. Phytotax. Sin. 1(1): 95. 1951.

Kingidium taeniale (Lindl.) P.F. Hunt, Kew Bull. 24: 98. 1970; Chowdhery, Orch. Fl. Arun. Pradh. 463. 1998; Pradhan, Indian Orch. Guide Identif. Cult. 2: 550. 1979; Hedge, Orch. Arun. Pradh. 76. 1984; Bose *et al.* Orch. India. 302. 1999.

Polychilos taenialis (Lindl.) P.S. Shim, Malayan Nat. J. 36: 28. 1982. [Fig. 4.38]

Plant epiphytic herb, 8-11 cm tall; roots tufted, numerous. Leaves solitary or 2, 4-9 × 1.2-2.5 cm, elliptic-obovate, acute, sessile, jointed. Inflorescence solitary or 2, longer than the leaves, pendent, racemes, 4 to 8-flowered; peduncle 2.5-4 cm long; rachis 2-3 cm long, ridged; pedicellate-ovary 1-1.5 cm long. Flowers 1.6-2 cm across; pale purple, pink to white changing to pale green in maturity; floral bracts ovate-triangular. Sepals subequal, obtuse; dorsal sepal 1-1.4 × 0.5-0.6 cm, oblong-ob lanceolate; lateral pair 0.9-1.2 × 0.6-0.7 cm, broadly elliptic. Petals 1-1.2 × 0.6-0.7 cm, obovate, obtuse. Lip 1-1.3 × 0.4-0.5 cm, adnate to the foot of the column; hypochile spurred, with 2 long, backward projecting lobes; epichile spatulate-oblong, entire, upper surface with a forked appendage. Column 4-5 mm long, narrowly winged; spur cylindrical-conical. Anther depressed; pollinia subglobose.

Flowering	: April – May; Fruiting: May – June.
Specimen cited	: Ramam forest 2300 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0446 . dt. 27. 05. 2008.
Status	: Rare.
Local distribution	: Rimbick, Budhabaray, Mungpoo, Baggonra, 1000 – 2800 m.
General distribution	: India (Sikkim, West Bengal); Bhutan, China, Nepal.

Pomatocalpa Breda

Plants small, epiphytic herb. Stems erect or pendulous. Leaves narrowly oblong, coriaceous. Inflorescence axillary, paniculate or racemes, many-flowered; peduncle long. Flowers small, non-resupinate. Sepals and petals similar, spreading, free. Lip fleshy, 3-lobed, spurred or saccate, with a tongue-like, often bifurcate callus projecting from the back wall. Column short, stout; rostellum hamulate; pollinia 4.

The genus *Pomatocalpa* Breda, comprises about 40 species distributed in Mainland Asia, Sri Lanka, China, Taiwan, Indo-China, Malaysia, Indonesia, the Philippines and New Guinea.

Pomatocalpa armigerum (King & Pantl.) Tang & Wang, Acta Phytotax. Sin. 1(1): 98. 1951; Pradhan, Indian Orch. Guide Identif. Cult. 2: 519. 1979; Hedge, Orch. Arun. Pradh. 78. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 619. 1998; Bose *et al.* Orch. India. 410. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 545. 2002; Lucksom, Orch. Sikkim N.E. Himal. 809-810. t. 823, pl. 36. 2007; Misra, Orch. India. 314.

2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1548. 2012.

Cleisostoma armigerum King & Pantl., J. Asiat. Soc. Bengal. 65(2): 123. 1896; Bruhl, Guide Orch. Sikkim. 139. 1926.

Plant epiphytic herb, 14-22 cm tall. Stem erect, rigid, sheathed. Leaves 6-9, 6-13 × 0.5-0.7 cm, distichous, fleshy, semi-terete, acute, sessile, jointed. Inflorescence extra-axillary, subcapitate, densely 6 to 9-flowered; peduncle short, sheathed; pedicellate-ovary 0.4-0.6 cm long. Flowers 6-8 mm across, pale straw-coloured flushed with pink; floral bracts ovate. Dorsal sepal 3.2-3.7 × 1.5-2.2 mm, spreading, ovate-orbicular, acute to apiculate; lateral pair 3.3-3.7 × 1.6-2.2 mm, spreading. Petals 1.8-2.7 × 0.6-0.8 mm, smaller than the sepals, oblanceolate, acute. Lip 3-4 × 2-2.2 mm long, 3-lobed, spurred; side lobes erect, recurved; apical lobe ovate, obtuse; spur saccate at base. Column 1-1.8 mm long, adnate to lip. Anther depressed; pollinia 2.

Flowering : August – September; Fruiting: September – October.

Specimen cited : Kalijhora forest 400 m, **Rajendra Yonzon, D. Lama and R. B. Bhujel 1402**, dt. 05. 08. 2010.

Status : Threatened.

Local distribution : Birik, Sukuna, 27th Mile N.H.P.C. Project sides, Kumai, Solok-Kalimpong, Gasoke, 200 – 700 m.

General distribution : India (North East India, Sikkim, West Bengal).

Pteroceras Hassk.

Plant epiphytic herb, monopodial. Stems pendulous, sheathed. Leaves few to many, tip usually 2-lobed. Inflorescence racemes, few to many-flowered. Flowers small (1-1.3 cm across). Sepals and petals free, spreading; lateral sepals often broader than petals, adnate to the column foot. Lip 3-lobed, mobile, spurred; side lobes large; apical lobe very short; spur porrect. Column short, stout; foot long; rostellum projection oblong; pollinia 2.

The genus *Pteroceras* Hassk., comprises 19 species distributed from India, Nepal, China, through South East Asia to the Philippines, Sumatra, Borneo and Java.

Pteroceras teres (Bl.) Holtt., Kew Bull. 14: 271. 1960; Hook. f., Fl. Brit. India 5: 857. 1890; King & Pantl., Orch. Sikkim Himal. 89. 1898; Pearce & Cribb, Fl. Bhutan, 3(3): 550, t, 549. 2002; Lucksom, Orch. Sikkim N.E. Himal. 870. t. 878, pl.

38. 2007; Misra, Orch. India. 315. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1548. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 274. 2013.

Dendrocolla teres Bl., Bijdr.: 289. 1825.

Aerides suaveolens Roxb., Fl. Ind. ed. 1832, 3: 473. 1832.

A. teres (Bl.) Lindl., Gen. Sp. Orchd. Pl.: 240. 1833.

Sarcochilus teres (Bl.) Rchb. f., Walpers, Ann. Bot. Syst. 6: 499. 1863.

Thrixspermum teres (Bl.) Rchb. f., Xenia. Orchid. 2: 121, t.140. 1867.

Sarcochilus suaveolens (Roxb.) Hook. f., Fl. Brit. India 6(1): 33. 1890.

Pteroceras suaveolens (Roxb.) Holtt., Kew Bull. 14: 271. 1960; Pradhan, Indian Orch. Guide Identif. Cult. 2: 502. 1979; Hedge, Orch. Arun. Pradh. 79. 1984; Deva & Naithani, Orch. N.W. Himal. 415. t. 414. 1986; Bose *et al.* Orch. India. 415. 1999. *P. teres* (Bl.) Bakhuizen, Blumea 12(1): 69. 1963.

Saccolabium pumilio sensu Bhattacharya, Bull. Bot. Soc. Bengal 23(2): 162, t.6. 1969, *non* Rchb. f. [Plate 4.27. D]

Plant epiphytic herb, pendent, 17-26 cm long. Stem unbranched, sheathed. Leaves 4-13, 5-16 × 1.4-3.1 cm, linear-lanceolate, oblique, 2-lobed, sessile, jointed. Inflorescence solitary (or 2-4 superposed) 4 to 12-flowered; peduncle 1.5-7.8 × 0.1-0.18 cm; rachis 4.6-7.5 cm long; pedicellate-ovary 0.7-0.9 cm long. Flowers 1-1.3 cm across, yellow with reddish-brown spots; floral bracts glabrous. Dorsal sepal 6-8 × 4-4.8 mm, spreading, obovate to elliptic, obtuse; lateral pair 6-9 × 4-4.9 mm, adnate to the column foot, obliquely obovate, truncate to rounded. Petals 6-7.9 × 3.4-3.9 mm, narrowly obovate, obtuse, base clawed. Lip 4.6-6.8 × 0.2-0.3 cm long, yellow, sessile, epichile spurred; side lobes erect, linear-oblong to slightly falcate; apical lobe ridge-like callus, surface rugose-papillose; spur cylindrical, glabrous. Column 1.9-2.5 mm tall, subterete; foot short. Anther beaked; pollinia 2.

Flowering : June – August; Fruiting: July – September.

Specimen cited : Guling forest 800 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0915**, dt. 27. 07. 2009.

Status : Rare.

Local distribution : Panbu, Suruk, Dudhey-Soureni, Suruk, Gasoke, 300 – 1100 m.

General distribution : India (Sikkim, West Bengal); Bangladesh, Cambodia, Indoneasia; Laos, Moluccas, Myanmar, Malaysia, Nepal, Philippines, Sulawesi and Thailand.

Rhynchosstylis Bl.

Plant perennial epiphytic herb. Stems short, stout. Leaves coriaceous, linear-oblong, tip unequally 2-lobed. Inflorescence lateral, pendent, racemes, densely many-flowered. Flowers resupinate. Sepals and petals similar, spreading, often purple spotted, petals narrower than the sepals. Lip adnate to the column foot, 3-lobed or simple, spurred; spur backward-pointing, laterally flattened. Column short; foot short. Anther rounded; pollinia 2.

The genus *Rhynchosstylis* Bl., comprises 3 or 4 species distributed from Sri Lanka, India through South East Asia, China, the Philippines and South through Malaysia and Indonesia.

Rhynchosstylis retusa (L.) Bl., Bijdr.: 286, T.49. 1825; Hook. f., Fl. Brit. India 6: 32. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 213, t. 284. 1898; Bruhl, Guide Orch. Sikkim. 128. 1926; Tuyama in Hara, Fl. E. Himal. 1: 449. 1966; Tuyama in Hara, Fl. E. Himal. 2: 194. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 551-552. 1979; Banerji, Orch. Nepal. 120. 1982; Hedge, Orch. Arun. Pradh. 79. 1984; Deva & Naithani, Orch. N.W. Himal. 415 – 419. t. 416. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 116. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 626-628. 1998; Bose *et al.* Orch. India. 419. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 552, t. 551. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 208-209. 2005; *et* 100 N.E. Indian Orch. 208-209. 2006; Lucksom, Orch. Sikkim N.E. Himal. 844-845. t. 864, pl. 37. 2007; Misra, Orch. India. 315. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 463. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1548. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 276. 2013; Misra, Orch. Odisha. 366-367. 2014.

Epidendrum retusum L., Sp. Pl. 2: 953. 1753.

Aerides undulatum J.E. Sm., Rees, Cycl. 39(Addenda) 39: *Aerides*, no.13. 1819.

A. spicatum D. Don, Prodr. Fl. Nepal.: 31. 1825.

Epidendrum hippium Buch.-Ham. *ex* D. Don, Prodr. Fl. Nepal.: 32. 1825.

Sarcanthus guttatus Lindl., Bot. Reg. 17: t.1443. 1831.

Saccolabium rheedii Wight, Ic. t. 1745, 46. 1851.

Saccolabium berkeleyi Reichb. f., Gard. Chron. 2, 19: 814. 1883; Hook. f., Fl. Brit. India 6: 33. 1890. [Plate 4.28. A]

Plant epiphytic herb. Stem 13-28 cm long, stout, sheathed. Leaves 9-15, 12-33 × 1.6-3.7 cm, distichous, spreading to arching, lorate, tip obliquely 2-lobed, coriaceous, deeply channeled, sessile, jointed. Inflorescence 22-31 cm long, longer than the leaves, densely many-flowered; peduncle 6-10 cm long; rachis 9-31 cm long; pedicellate-ovary 1-1.4 cm long. Flowers 1.6-1.9 cm across, white with light purple marked; floral bracts membranous. Dorsal sepal 0.7-0.9 × 0.5-0.6 cm, elliptic, obtuse; lateral pair 0.8-1 × 0.7-0.8 cm, obliquely ovate, obtuse. Petals 0.8-0.9 × 0.3-0.4 cm, oblong-ovate, rounded. Lip 1-1.2 × 0.5-0.6 cm, light purple, white at apex,

strongly saccate-spurred at base, adnate to the column foot; epichile oblong-spathulate, apex rounded; spur cylindrical. Column 3 mm long, with a foot. Anther beaked; pollinia 2.

Flowering	: May – July; Fruiting: July – September.
Specimen cited	: Samalbung Busty 900 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0519 , dt. 22. 06. 2008.
Status	: Frequent.
Local distribution	: Sevoke, Bagrakot, Jaldhaka, Sittong, Mungpong, Sinjee, Gasoke, 150 – 900 m.
General distribution	: India (North East India, Sikkim, West Bengal); China, Bhutan, Java, Malaya, Myanmar, Nepal, Philippines, Sumatra and Thailand.

Saccolabiopsis J.J. Sm.

Plants small epiphytic herb. Stem pendent, short. Leaves oblong-elliptic, sessile, tip bifid. Inflorescence lateral, slender, racemes, laxly many-flowered. Flowers minute, thin-textured. Sepals and petals similar. Lip firmly adnate to the column base, spurred, side lobes prominent. Column small, cylindrical, foot absent; pollinia 2.

The genus *Saccolabiopsis* J.J. Sm., comprises about 12 species distributed from the North West Himalaya to New Guinea and Australia.

Saccolabiopsis pusilla (Lindl.) Seidenf. & Garay, Bot. Tidsskr. 67: 118, t.33. 1972; Pradhan, Indian Orch. Guide Identif. Cult. 2: 440. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 633. 1998; Bose *et al.* Orch. India. 422. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 555 et 557, t. 556. 2002; Lucksom, Orch. Sikkim N.E. Himal. 847. t. 867. 2007; Misra, Orch. India. 316. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1548. 2012.

Oeceoclades pusilla Lindl., Wall. Cat.: 7332. 1832; Gen. Sp. Orchid. Pl.: 237. 1833.

Saccolabium pusillum sensu (Lindl.) Lindl. *ex* Jackson, Index Kew. 2: 775. 1893.

S. pumilio Rchb. f., Walpers, Ann. Bot. Syst. 6: 886. 1864; Hook. f., Fl. Brit. India 6: 56. 1890; Bruhl, Guide Orch. Sikkim. 133. 1926.

Gastrochilus pumilio (Rchb. f.) Kuntze, Revis. Gen. Pl. 2: 661. 1891.

Pennilabium pumilio (Rchb. f.) Pradhan, Indian Orch.: Guide Identif. Cult. 2: 572. 1979. [Fig. 4.39]

Plant epiphytic herb, 5-9 cm tall. Stem sheathed. Leaves 2-3, 4-7.3 × 0.9-1.6 cm, oblong-elliptic, curved, tip unequally bifid, sessile. Inflorescence 2-3, about as long as the leaves, racemes, laxly 18 to 27-flowered; peduncle 2.8-4.7 cm long, slender; rachis 4-6 cm long, slender; pedicellate-ovary 4-5 mm long. Flowers 4-5 mm across; cream coloured; floral bracts oblong. Dorsal sepal 2.2-2.5 × 0.9-1.3 mm, oblanceolate-oblong, obtuse, concave, arching over the column; lateral pair 2.3-2.6 × 1.2-1.5 mm, spreading, elliptic, obtuse. Petals 1.7-2.3 × 0.5-0.7 mm, smaller than the sepals, linear-oblanceolate, obtuse, toothed at one side. Lip 2-3.4 × 1.5-4 mm, 3-lobed, cream, purple at mouth of spur and on apical lobe, spurred; hypochile with rounded side lobes; epichile acute, decurved; spur recurved. Column 1 mm long. Anther beaked; pollinia ovoid.

Flowering	: February – April; Fruiting: March – May.
Specimen cited	: Sevoke forest 300 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1090 , dt. 22. 03. 2010.
Status	: Rare.
Local distribution	: Gorubathan, Kumai, Jaldhaka, Sepkhola, Kambal, 200 – 500 m.
General distribution	: India (North East India, Sikkim, West Bengal); Bhutan, Myanmar, Thailand.

Smitinandia Holtt.

Plants perennial epiphytic herb. Stem pendent. Leaves linear, lanceolate, distichous. Inflorescence lateral, racemes, many-flowered. Flowers small, fleshy. Lip spurred; spur with mouth more or less closed by a high, fleshy. Column short, cylindrical, broadened at base, with a distinct foot; rostellum short; pollinia 4.

The genus *Smitinandia* Holtt., comprises 3 species distributed from India, Bhutan, Myanmar, South East Asia to Malaysia and Borneo.

Smitinandia micrantha (Lindl.) Holtt., Gard. Bull. Singapore 25: 106. 1969; Pradhan, Indian Orch. Guide Identif. Cult. 2: 53 0. 1979; Hedge, Orch. Arun. Pradh. 80. 1984; Deva & Naithani, Orch. N.W. Himal. 419. t. 417. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 118. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 642. 1998; Bose *et al.* Orch. India. 431. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 559, t. 560. 2002; Lucksom, Orch. Sikkim N.E. Himal. 808-809. t. 822, pl. 35. 2007; Misra, Orch. India. 316. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1548. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 282. 2013; Misra, Orch. Odisha. 348-349. 2014.

Saccolabium micranthum Lindl., Gen. Sp. Orchid. Pl.: 220. 1833; Hook. f., Fl. Brit. India 6: 59. 1890.

S. fissum Ridl., J. Linn. Soc., Bot. 32: 361. 1896.

Gastrochilus parviflorus Kuntze, Revis. Gen. Pl. 2: 661. 1891.

Cleisostoma micranthum (Lindl.) King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 234, t.312. 1898; Bruhl, Guide Orch. Sikkim. 138. 1926.

Uncifera albiflora Guillaumin, Bull. Soc. Bot. France 77: 333. 1930.

Cleisostoma poilanei Gagnep., *op. cit.* 79: 34 1932.

C. petitiana Guillaumin, Bull. Mus. Natl. Hist. Nat. ser.2, 17(5): 434. 1945.

Ascocentrum micranthum (Lindl.) Holtt., Gard. Bull. Singapore 11: 275. 1947.

Pomatocalpa poilanei (Gagnep.) Tang & Wang, Acta Phytotax. Sin. 1(1): 100. 1951.

Cleisostoma tixieri Guillaumin, Bull. Mus. Natl. Hist. Nat. Ser.2, 32(4): 369. 1960. [Plate 4.28. B]

Plant epiphytic herb, 18-25 cm long. Stem compressed, stout, sheathed. Leaves 6-10, 7-11 × 1.7-2.1 cm, distichous, oblong, keeled, tip obliquely truncate to unequally 2-lobed, sessile, jointed. Inflorescence leaf-opposed, longer than the leaves, 20 to 28-flowered; peduncle and rachis stout; pedicellate-ovary 2-2.5 mm long. Flowers 3-5 mm across; sepals and petals white with pink spots, lip pink-purple; floral bracts ovate. Dorsal sepal 1.5-1.8 × 1.4-1.6 mm, ovate, obtuse; lateral pair 2.5-2.8 × 1.6-1.8 mm, oblong-ovate, subacute. Petals 1.5-2 × 0.8-1 mm, smaller than the sepals, spreading, oblong, obtuse. Lip 2-2.5 × 1.5-1.8 mm, fleshy, 3-lobed, as long as the sepals, spurred; side lobes small; apical lobe obtuse, erose, margins thin; spur 2-callose inside. Column 0.5-0.7 mm long, stout. Anther beaked; pollinia 2.

Flowering : March – May; Fruiting: April – June.

Specimen cited : Panighatta 300 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0387**, dt. 20. 05. 2008.

Status : Sparse.

Local distribution : Sevoke, Sukuna, Samalbong Nimbong, Tindharay, Sittong, Mungpong, 150 – 1100 m.

General distribution : India (North East India, Sikkim, West Bengal, Western Himalaya); Bhutan, Cambodia, Laos, Malaysia, Myanmar, Nepal, Thailand and Vietnam.

Stereochilus Lindl.

Plants epiphytic herb, monopodial, erect. Stem short. Leaves coriaceous, tip bifid, sessile. Inflorescence axillary, racemes, drooping, lax, hairy. Sepals subequal, spreading. Lateral pair adnate to base of the lip. Petals smaller than the sepals. Lip about as long as sepals, adnate to the column base, spurred. Column erect; rostellum long, linear; stipe clavate; pollinia 4.

The genus *Stereochilus* Lindl., comprises 5 species distributed in North East India, Bhutan, Myanmar, China, Thailand and Vietnam.

Stereochilus hirtus Lindl., J. Proc. Linn. Soc., Bot. 3: 38. 1859; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 237, t. 315. 1898; Bruhl, Guide Orch. Sikkim. 140. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 495. 1979; Chowdhery, Orch. Fl. Arun. Pradh. 646-648. 1998; Bose *et al.* Orch. India. 436. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 564, t. 563. 2002; M. Pradhan, 100 N.E. Indian Orch. 210-211. 2006; Lucksom, Orch. Sikkim N.E. Himal. 835-836. t. 850, pl. 36. 2007; Misra, Orch. India. 317. 2007; Yonzon *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1548. 2012.

Sarcophilus hirtus (Lindl.) Benth., Benth. & Hook. f., Gen. Pl. 3: 576. 1883; Hook. f., Fl. Brit. India 6: 35. 1890.

Plant epiphytic herb, 7-10 cm tall. Stem sheathed. Leaves 6-10, 6-11.5 × 0.7-1.4 cm, fleshy, almost terete, linear-oblong, tip minutely bifid. Inflorescence axillary, longer than the leaves, laxly 6 to 9-flowered; peduncle 4-6 cm long; rachis 4-10 cm long, slightly zigzag; pedicellate-ovary 1-1.2 cm long, hairy. Flowers 1-1.5 cm across, glabrous; yellowish light purple; floral bracts hairy. Dorsal sepal 5-7 × 2-3 mm, spreading, oblong-lanceolate, obtuse; lateral pair 5-7.5 × 3-4 mm, spreading, ovate, obtuse. Petals 6-7 × 2-3 mm, spreading, ovate, obtuse, margins crenate. Lip 5-6 mm long, 3-lobed, white and pink, adnate to the column base, spurred; side lobes triangular, converging; apical lobe oblong-ovate, obtuse; spur conical. Column 2.5-3 mm tall, white, dilated at base. Anther purple; pollinia 4.

Flowering	: May – June; Fruiting: June – July.
Specimen cited	: Sirikhola forest 2400 m, Rajendra Yonzon, D. Lama and R. B. Bhujel 0439 , dt. 27. 05. 2008.
Status	: Rare.
Local distribution	: Dhotrey, Rambhi forest, Tangta, Nockdara, 1800–2500m.
General distribution	: India (North East India, Sikkim, West Bengal); Myanmar.

Uncifera Lindl.

Plants perennial epiphytic herbs, pendent. Stem slender. Leaves overlapping, distichous. Inflorescence pendent, axillary, racemes, leaf-opposed. Sepals and petals subequal, adnate to the column. Lip simple, funnel shaped, spurred. Column terete, bent down over spur entrance; stipes long, linear, upper end winged, bent and hooked upwards. Anther imperfectly 2-celled; pollinia 2.

The genus *Uncifera* Lindl., comprises about 6 species distributed from the Himalayas through South East Asia to Vietnam.

Uncifera obtusifolia Lindl., J. Proc. Linn. Soc., Bot. 3: 40. 1859; Tuyama in Hara, Fl. E. Himal. 2: 195. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 529. 1979; Hedge, Orch. Arun. Pradh. 81-82. 1984; Chowdhery, Orch. Fl. Arun. Pradh. 679-682. 1998; Bose *et al.* Orch. India. 455. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 572, t. 571. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 212-213. 2005; Lucksom, Orch. Sikkim N.E. Himal. 843. t. 861, pl. 37. 2007; Mishra, Orch. India. 319. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1549. 2012.

Uncifera heteroglossa Rchb. f., Gard. Chron. n.s., 10: 234. 1878.

Saccolabium obtusifolium (Lindl.) Hook. f., Fl. Brit. India 6: 65. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 222, t. 295. 1898; Bruhl, Guide Orch. Sikkim. 136. 1926.

Gastrochilus obtusifolius (Lindl.) Kuntze, Revis. Gen. Pl. 2: 661. 1891; A.S. Rao & Mukherjee, Rec. Bot. Surv. India 20 (2): 213. 1973. [Plate 4.28. C]

Plant epiphytic herb, pendent, 23-29 cm tall. Stem sheathed. Leaves 4-7, 9-20 × 2.4-3 cm, oblong-elliptic, tip unequally 2-lobed. Inflorescence leaf-opposed, densely many-flowered; peduncle 5-8 cm long; rachis 7-10 cm long, glabrous; pedicellate-ovary 4-6 mm long. Flowers 1-1.3 cm across, pale yellow to greenish-yellow; floral bracts oblong-lanceolate. Dorsal sepal 4-6.5 × 4-4.5 mm, obovate, obtuse, concave; lateral pair 4.5-6.6 × 4-4.3 mm, spreading. Petals 4-6 × 4-5 mm, broadly obovate, obtuse. Lip 4-5 mm long, 3-lobed, spurred; side lobes small; apical lobe thickened, 3-lobulate; spur curved forwards. Column 2-3 mm long, slightly winged. Anther beaked; pollinia 2.

Flowering	: August – September; Fruiting: September – October.
Specimen cited	: Sonadah forest 1900 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0927 , dt. 18. 08. 2009.
Status	: Rare.
Local distribution	: Sukiapokhari, Lava, Rambh forest, Kafer, Tungsong, 1100 – 1900 m.
General distribution	: India (North East India, Sikkim, West Bengal).

Vanda Jones ex R. Br.

Plants perennial epiphytic herb. Stems stiffly erect. Leaves distichous, decurved, linear, oblong, rigid, tip praemorse, sessile, jointed. Inflorescence axillary, racemes. Flowers fleshy, resupinate. Sepals and petals subequal, spreading, elliptic-obovate, twisted or undulate, often tessellated, margins reflexed, narrowed at base. Lip 3-lobed, usually saccate or spurred. Column short, stout, without a foot. Anther 2-celled; pollinia 2.

The genus *Vanda* Jones ex R. Br., comprises about 50 species distributed from Sri Lanka and India to China, South East Asia, the Malay Archipelago, the Philippines, Australia, New Guinea and the Solomon Islands.

Key to the species

1. Lip apex with 2 elongate, divaricate 2-lobed processes.....*V. cristata*
- 1a. Lip apex simple, without apical processes.....2

2. Sepals and petals cream to yellow;
flowers more than 2.5 cm across.....*V. pumila*
- 2a. Sepals and petals pale green; flowers less than 2 cm across.....*V. alpina*

Vanda alpina (Lindl.) Lindl., Fol. Orchid. Vanda 4:10, no.25. 1853; Hook. f., Fl. Brit. India 6: 53. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 217, t. 289. 1898; Karthikeyan *et al.*, Fl. Indicae Enum. Monocot. 175. 1989; Bruhl, Guide Orch. Sikkim. 129. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 569. 1979; Banerji, Orch. Nepal. 122. 1982; Hedge, Orch. Arun. Pradh. 82. 1984; Deva & Naithani, Orch. N.W. Himal. 423. t. 422. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 683. 1998; Bose *et al.* Orch. India. 458. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 574. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 214-215. 2005; *et* 100 N.E. Indian Orch. 214-215. 2006; Lucksom, Orch. Sikkim N.E. Himal. 841-842. t. 859. 2007; Misra, Orch. India. 319. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1549. 2012.

Luisia alpina Lindl., Bot. Reg. 24: misc.56, no.101. 1838.

Trudelia alpina (Lindl.) Garay, Orchid Digest 50(2): 76. 1986.

Stauroopsis alpina (Lindl.) Tang & Wang, Acta Phytotax. Sin. 1: 93. 1951. [Fig. 4.40]

Plant epiphytic herb, 18-33 cm tall. Stems sheathed. Leaves many, 8-13 × 1.2-1.5 cm, linear-oblong, tip unequally 2-lobed. Inflorescence shorter than the leaves, axillary, 1 to 3-flowered; peduncle glabrous; pedicellate-ovary ridged, glabrous. Flowers 1.2-2 cm across, sepals and petals pale-green; floral bracts triangular. Dorsal

sepal 1-1.4 × 0.4-0.6 cm, elliptic-ovate, obtuse; lateral pair 1.2-1.5 × 0.5-0.6 cm, spreading. Petals 1.2-1.4 × 0.3-0.5 cm, oblong. Lip 1-1.5 × 0.8-0.9 cm, adnate to the column, obscurely 3-lobed, green, deeply gibbous at base; apical lobe retuse, concave, entire, rounded; side lobes incurved. Column 0.4-0.5 mm long, fleshy. Anther flattened with dots; pollinia yellow.

Flowering : May – July; Fruiting: June – August.
Specimen cited : Kafer forest 1900 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 1211**, dt. 04. 06. 2010.
Status : Threatened.
Local distribution : Algarah, Munsong, 800 – 2000 m.
General distribution : India (North East India, Sikkim); Bhutan.

Vanda cristata Lindl., Gen. Sp. Orchid. Pl.: 216. 1833; Hook. f., Fl. Brit. India 6: 53. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 216, t. 287. 1898; Bruhl, Guide Orch. Sikkim. 130. 1926; Tuyama in Hara, Fl. E. Himal. 2: 195. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 570. 1979; Banerji, Orch. Nepal. 122-123. 1982; Hedge, Orch. Arun. Pradh. 83. 1984; Deva & Naithani, Orch. N.W. Himal. 424. t. 427. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 686. 1998; Bose *et al.* Orch. India. 460. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 574-575. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 216-217. 2005; *et* 100 N.E. Indian Orch. 218-219. 2006; Lucksom, Orch. Sikkim N.E. Himal. 840. t. 856, pl. 37. 2007; Misra, Orch. India. 319. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1549. 2012; *et* McAllen Int. Orch. Soc. J.14(2): 8-13. 2013; Chowdhery & Agrawala, A Century W.H. Orch. 290. 2013.

Trudelia cristata (Lindl.) Senghas Schltr., Orchideen ed.3, 1(19-20): 1211. 1988; Pradhan & Pradhan, 100 Beaut. Orch. 122. 1997.

Plant epiphytic herb, 17-28 cm tall. Stem stout, sheathed. Leaves many, 9-16 × 1.3-1.8 cm, narrowly oblong, recurved, coriaceous, truncately, tip unequally 2-lobed. Inflorescence racemes, shorter than the leaves, 2 to 6-flowered; peduncle sheathed; rachis slightly zigzag; pedicellate-ovary ridged. Flowers 3.4-4.6 cm across, yellow to green; floral bracts obtuse. Dorsal sepal 1.9-3.6 × 0.7-1.2 cm, incurved, oblong, obtuse; lateral pair 1.9-3.2 × 0.7-1.1 cm, similar. Petals 1.8-3.5 × 0.5-0.7 cm, oblong, narrower than the sepals. Lip 2-3.5 × 1.2-2.4 cm, fleshy, 3-lobed, adnate to the base of the column, golden-yellow to white, striped with violet-purple to red-brown, saccately spurred; side lobes erect; apical lobe oblong, with 2 divaricate, oblong projections at apex and a fleshy beak directed downwards; spur infundibuliform. Column 0.6-0.8 cm long. Anthers oval; pollinia 2.

Flowering : April – June; Fruiting: May – August.
Specimen cited : Todey forest 1300 m, **Rajendra Yonzone, D. Lama and R. B. Bhujel 0434**, dt. 27. 05. 2008.

Status	: Common.
Local distribution	: Lungshel, Daw Hill, Samalbong, Sinjee, Mangmaya, Seokbir khani, Mirik, Sendaybong, Mangmaya, 700 – 1900 m.
General distribution	: India (North East India, Sikkim, West Bengal); Bhutan and Nepal.

Note: Observed Intraspecific variation in floral morphology of *Vanda cristata* Lindl. [Plate 4.21]

The distinct variation in floral morphology and colour of flower, size of whole flower was observed bigger measuring 4.1 to 4.3 cm across (petal to petal) when compared to normal size that measured 2.8 to 3 cm. The normal floral colour is yellowish green but in the plant showing variation it was observed green colour. All other floral parts showed clearly much bigger size than the normal.

Significant variation was noted in flower characters. The flower color of specimen A is yellowish green in color, infinitively very small in size, floral members are all straight and smaller with smaller lip and not arched over column in comparison with specimen B the color of flower is proper green, all the floral members *i.e.*, dorsal sepal, lateral pair are large and petals are arched over column and lip and lateral pair are 1-1.8 cm close to each other and are bigger in size. A and B are flowers A1 and B1 are flowers perigone with column and pedicel and A2 and B2 are the lip of type species and intraspecific variation occurred species of *Vanda cristata* Lindl., these variations are clearly shown in Plate 4.21. where A, A1 and A2 and normal type species whereas B, B1 and B2 are plant showing variation that clearly shows difference in two studied specimens Table 4.3.

Table 4.3: Comparative morphology of flowers of *Vanda cristata* Lindl.

Plant characters	Normal Species	Variant Species
Height	17-28 cm	20-29 cm
Stem	6-9 cm	7-10 cm
Leaves	6-14 nos., 4-12 × 1.2-1.7cm	9-15 nos., 3-13 × 1.3-1.8 cm
Inflorescence	1-4, 5-7, 2-6 flowers, peduncle 2-2.4 cm, rachis 0.5 cm	1-2, 6-9, 2-4 flowers, peduncle 2.2-2.5, rachis 0.5 cm
Flower	Yellowish green; 2.8-3 cm across (petal to petal) lateral sepal to lateral sepal 2.2-2.5 cm, dorsal sepal to lateral pair 2.5-3.4 cm across. Column 0.7-0.8 × 0.5-0.6, white. anther 0.4 × 0.3 cm, ovate, white; pollinia 2, yellow,	Proper green in colour; 4.1-4.3 across (petal to petal) lateral sepal to lateral sepal 1-1.8 cm, dorsal sepal to lateral pair 3.6-3.9 cm, dorsal sepal to petal 3-4.4 cm across; Column 0.9-1 × 0.7-0.8 cm. anther 0.6 × 0.5cm; pollinia 2, yellow, 2 × 1.9 mm.

	1.6 × 1.4 mm.	
Dorsal Sepal	1.5-2 × 0.6-0.8 cm, dorsal sepal-lateral pair 2.5-2.8 cm across.	3.3-3.6 × 1-1.3 cm. dorsal sepal-lateral pair -3.6-3.9 cm across
Lateral pair (Sepals)	1.7-2 × 0.7-0.9 cm. lateral sepal - lateral sepal -2.2-2.5 cm across.	2.8-3 × 0.9-1.1 cm. lateral sepal - lateral sepal - 1-1.8 cm across.
Petals	1.6-1.8 × 0.5-0.6 cm. petal - petal-2.7-3 across.	3-3.4 × 0.7-0.8 cm. petal- petal-4.1-4.3 across.
Lip/ Labellum	2-2.2 × 0.9-1.6 cm when expanded, blackened at claw, 0.3-0.5 cm thick; distinctly 3-lobed, 0.7-0.8 deep infundibular spur at the base. Lamina fleshy with 4-5 carunculate ridges emerge from the hypochile proceed to the mesochile of lip. Apex of the apical lobe with 2 divaricate oblong lobules 0.4-0.6 and under the apex a horn-like beak 0.7-0.8 cm pointing downwards.	3.3-3.8 × 1.5-2.8 cm when expanded, 0.6-0.8 cm thick, triangular erect side lobes; proper blackened at claw adnate to the base of column, 3-lobed, 1.5 cm deep widely infundibular spur at the base, apical lobe 1.5 × 1.7 cm wide. Lamina fleshy with 6 carunculate ridges emerges from the hypochile and proceed to the mesochile of lip. Apex of the apical lobe with 2 divaricate oblong lobules 0.6-0.8 cm and under the apex a horn-like fleshy beak 1.3 pointing downwards.

Besides these, it was also observed that all the floral members *i.e.*, apical lobes of sepals and petals of variant species curved over the column and lip of flower. Finally, it is concluded that it is not a sub species, variety or forma but it is intraspecific variation in the population of *Vanda cristata* Lindl.

Vanda pumila Hook. f., Fl. Brit. India 6(1): 53. 1890; King & Pantl., Orch. Sikkim Himal. 216, t. 288. 1898; Bruhl, Guide Orch. Sikkim. 129. 1926; Pradhan, Indian Orch. Guide Identif. Cult. 2: 570. 1979; Banerji, Orch. Nepal. 123. 1982; Deva & Naithani, Orch. N.W. Himal. 424. t. 428. 1986; Chowdhery, Orch. Fl. Arun. Pradh. 688. 1998; Bose *et al.* Orch. India. 460. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 577. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 218-219. 2005; *et* 100 N.E. Indian Orch. 220-22. 2006; Lucksom, Orch. Sikkim N.E. Himal. 841. t. 858, pl. 37. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1549. 2012.

Vanda cristata var. Lindl., Fol. Orchid. Vanda 4: 10, no.23. 1853.

Trudelia pumila (Hook. f.) Senghas Schltr., Orchideen ed.3, 1(19-20): 1211. 1988.

Plant epiphytic herb, 11-24 cm tall. Stem stout, sheathed. Leaves many, 6-17 × 1.4-1.9 cm, linear-oblong, tip unequally 3-dentate. Inflorescence racemes, shorter than the leaves, 2 to 3-flowered; peduncle 2-2.8 cm long; rachis zigzag; pedicellate-ovary ridged. Flowers 2.5-3.5 cm across; sepals and petals subequal, cream to yellow; floral bracts elliptic-ovate. Dorsal sepal 2.4-2.6 × 0.7-0.8 cm, oblanceolate, obtuse to subacute; lateral pair 2.4-2.8 × 0.9-1.1 cm, oblong, curved, obtuse. Petals 2.4-2.8 × 0.4-0.6 cm, linear, acute. Lip 1.6-1.8 × 0.7-0.9 cm, shorter than the sepals, 3-lobed, pale cream streaked with purple to red, saccately spurred; side lobes small; apical lobe ovate, truncate at apex; spurred. Column 4-5 mm long, stout. Anther depressed; pollinia 2.

Flowering	: April – May; Fruiting: May – July.
Specimen cited	: Nurserymen’s Heaven, Holumba Floral Nursery, 980 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 1127 , dt. 14. 04. 2010.
Status	: Cultivated.
Local distribution	: National Research Centre for Orchids, Indian Council for Agricultural Research, Darjeeling Campus, 980 – 2300 m.
General distribution	: India (North East and North West India, Sikkim, West Bengal); China, Laos, Myanmar, Nepal, Thailand.

Vandopsis Pfitz.

Plant perennial epiphytic or lithophytic herb. Stem rigid, elongate, minutely warted. Leaves distichous, coriaceous, tip 2-lobed. Inflorescence axillary, racemes. Flowers fleshy, resupinate. Sepals and petals spreading. Lip smaller than the sepals and petals, adnate to the base of the column, geniculately bent, channeled or gibbous at base. Column short. Anther depressed; pollinia 2.

The genus *Vandopsis* Pfitz., comprises 5 species distributed in India, China, South East Asia, the Philippines, the Malay Archipelago and Indonesia to New Guinea.

Vandopsis undulata (Lindl.) J.J. Sm., Natuurk. Tijdschr. Ned.-Indie. 72: 77. 1912; Banerji, Orch. Nepal. 124. 1982; Deva & Naithani, Orch. N.W. Himal. 433. t. 432. 1986; Pradhan & Pradhan, 100 Beaut. Orch. 126. 1997; Chowdhery, Orch. Fl. Arun. Pradh. 692. 1998; Bose *et al.* Orch. India. 461. 1999; Pearce & Cribb, Fl. Bhutan, 3(3): 578 & 580, t. 579. 2002; M. Pradhan, 100 Sikkim Himal. Orch. 222-223. 2005;

Lucksom, Orch. Sikkim N.E. Himal. 792. t. 803, pl. 35. 2007; Misra, Orch. India. 319. 2007; Yonzone *et al.* Asian J. Pharm. Lif. Sci., 1(4): 464. 2011; *et* Int. J. Pharm. Life Sci. 3(3): 1549. 2012; Chowdhery & Agrawala, A Century W.H. Orch. 296. 2013.

Vanda undulata Lindl., J. Proc. Linn. Soc., Bot. 3: 42. 1859; Tuyama in Hara, Fl. E. Himal. 1: 452. 1966; Tuyama in Hara, Fl. E. Himal. 2: 195. 1971; Pradhan, Indian Orch. Guide Identif. Cult. 2: 566. 1979; Hedge, Orch. Arun. Pradh. 84. 1984.

Stauroopsis undulatus (Lindl.) Benth. *ex* Hook. f., Fl. Brit. India 6(1): 27. 1890; King & Pantl., Ann. Roy. Bot. Gard. (Calcutta) 8: 205, t. 275. 1898; Bruhl, Guide Orch. Sikkim. 124. 1926.

S. polyantha W.W. Sm., Notes Roy. Bot. Gard. Edinburgh 13: 220. 1921. [Plate 4.28. D]

Plant epiphytic herb, 30-65 cm tall. Stem stout, minutely warted, sheathed. Leaves 9-13, 6-12 × 1.3-2 cm, distichous, oblong, tip unequally 2-lobed. Inflorescence leaf-opposed, laxly 2 to 5-flowered; peduncle glabrous, sheathed; rachis glabrous; pedicellate-ovary 2-2.4 cm long, slender. Flowers 3.5-4.3 cm across, white; floral bracts ovate-lanceolate. Sepals oblong-spathulate; dorsal sepal 1.7-2.2 × 0.5-0.7 cm, edges wavy; lateral pair 1.7-2.1 × 0.6-0.9 cm, spreading. Petals 1.8-2.4 × 0.5-0.6 cm, spreading, narrowly oblong-spathulate, edges wavy. Lip 1.3-1.6 × 0.7-1 cm, fleshy, 3-lobed, adnate to the column; side lobes erect, rounded; apical lobe spathulate, truncate; disc with 2 ridges. Column stout. Anther dome-shaped; pollinia ovoid.

Flowering	: April – May; Fruiting: May – August.
Specimen cited	: Rimbick 2100 m, Rajendra Yonzone, D. Lama and R. B. Bhujel 0337 , dt. 26. 04. 2008.
Status	: Sparse.
Local distribution	: Nokdara, Baggonra, Toroyok Busty, Lava, Rambi, Senchale, 1800 – 2500 m.
General distribution	: India (North East and North West India, West Bengal); Bhutan, Nepal.

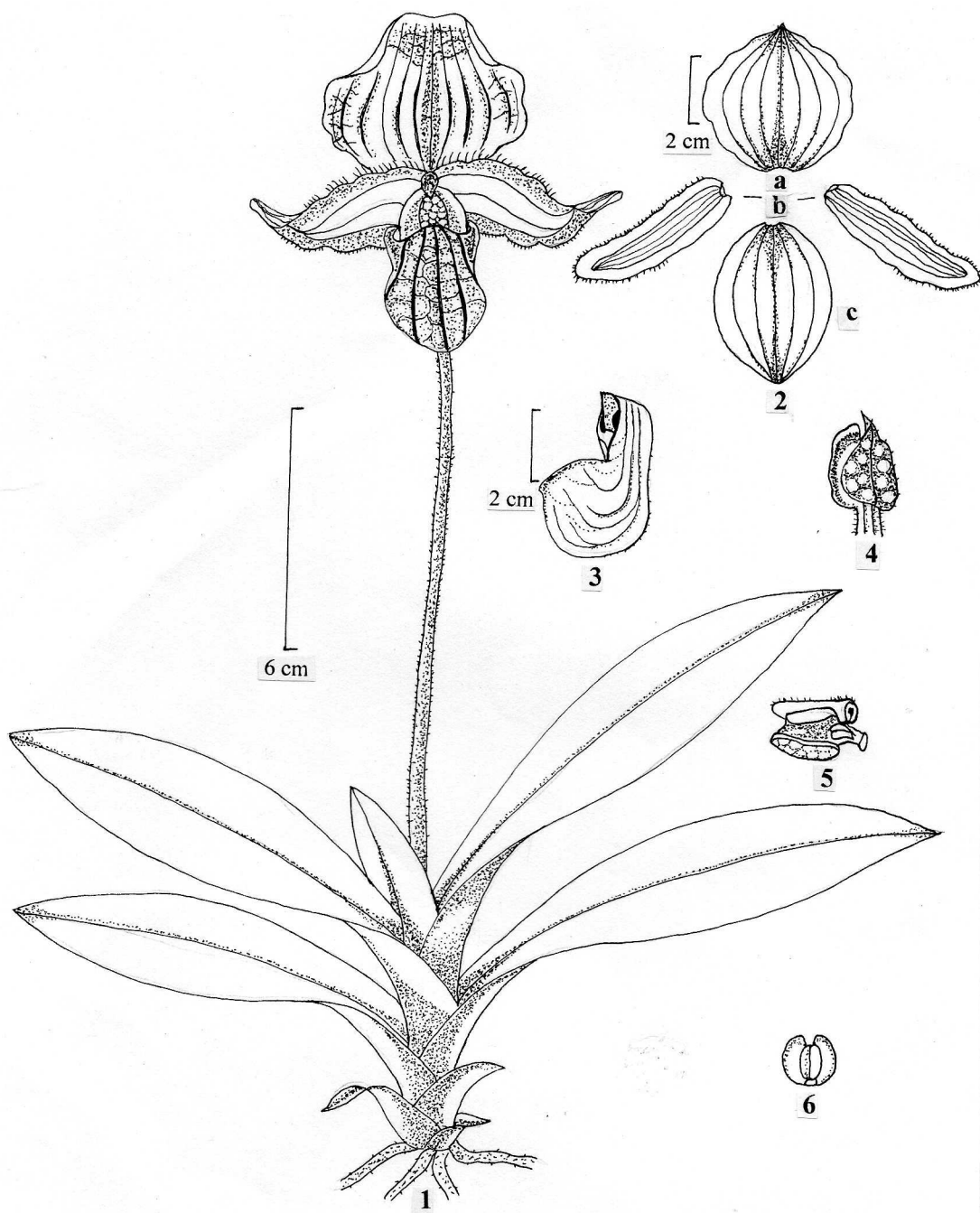


Fig. 4.1: *Paphiopedilum fairrieatum* (Lindl.) Stein, 1. Habit (whole plant with inflorescence); 2. Floral perigone, a. dorsal sepal, b. petals, c. synsepalum; 3. Lip; 4. Side view of column, staminode and stigma; 5. Angled viewed of the same showing anther; 6. Anther.

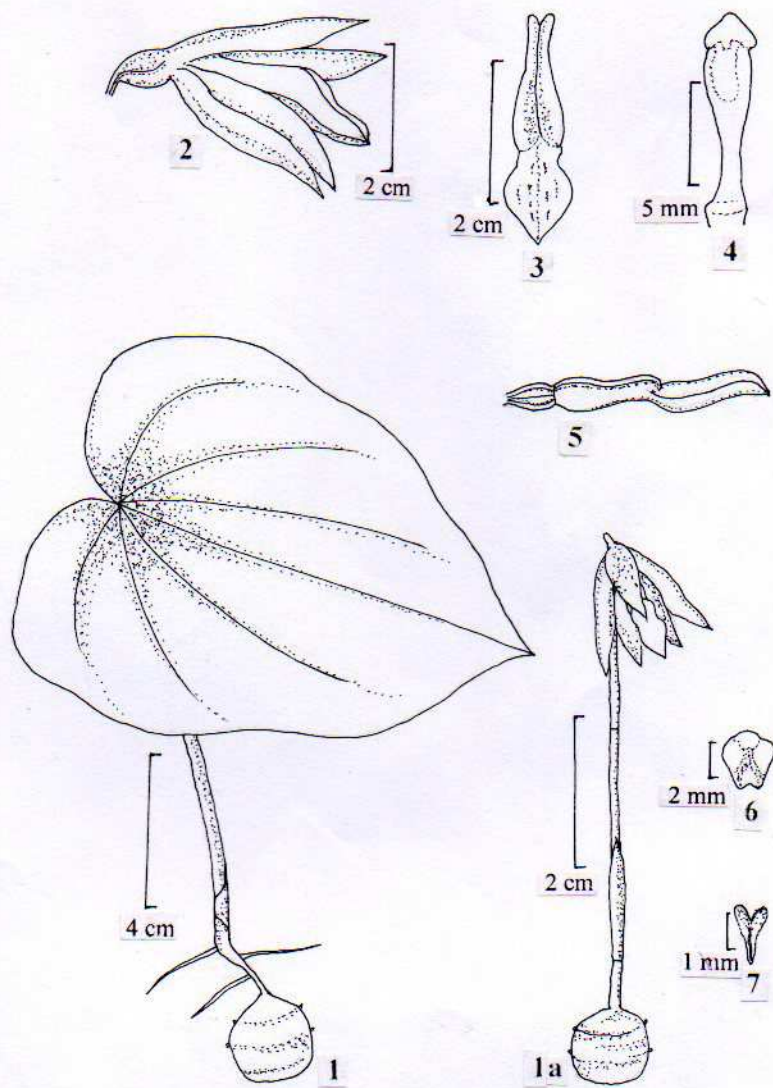


Fig. 4.2: *Nervilia macroglossa* (Hook. f.) Schltr. 1. Habit (Whole plant with tuber and leaf); 1a. Tuber with inflorescence; 2. Side view of flower; 3. Front view of lip; 4. Front view of column with anther; 5. Side view of tip of pedicellate ovary with lip; 6. Anther; 7. Pollinia.

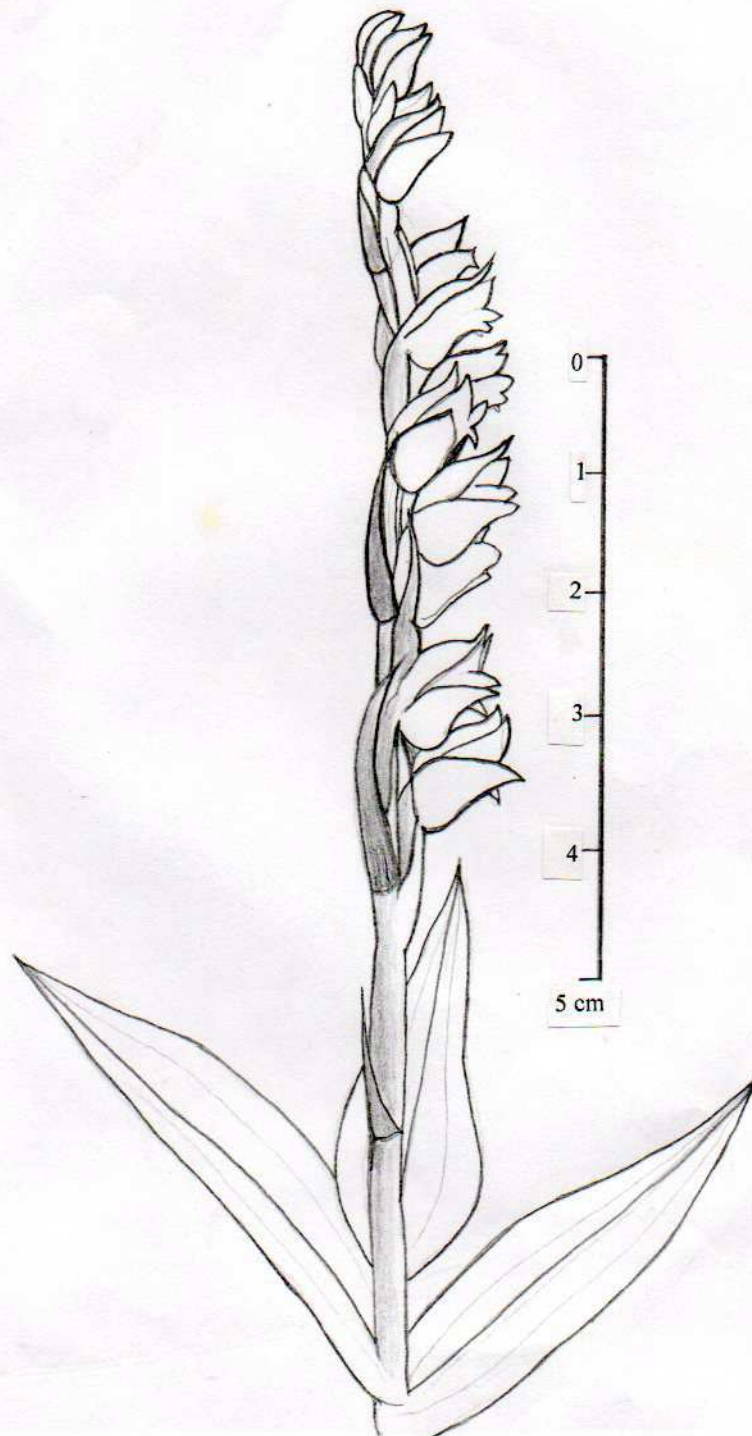


Fig. 4.3: *Goodyera vittata* (Lindl.) Benth. ex Hook. f.; Upper portion of a plant with inflorescence.

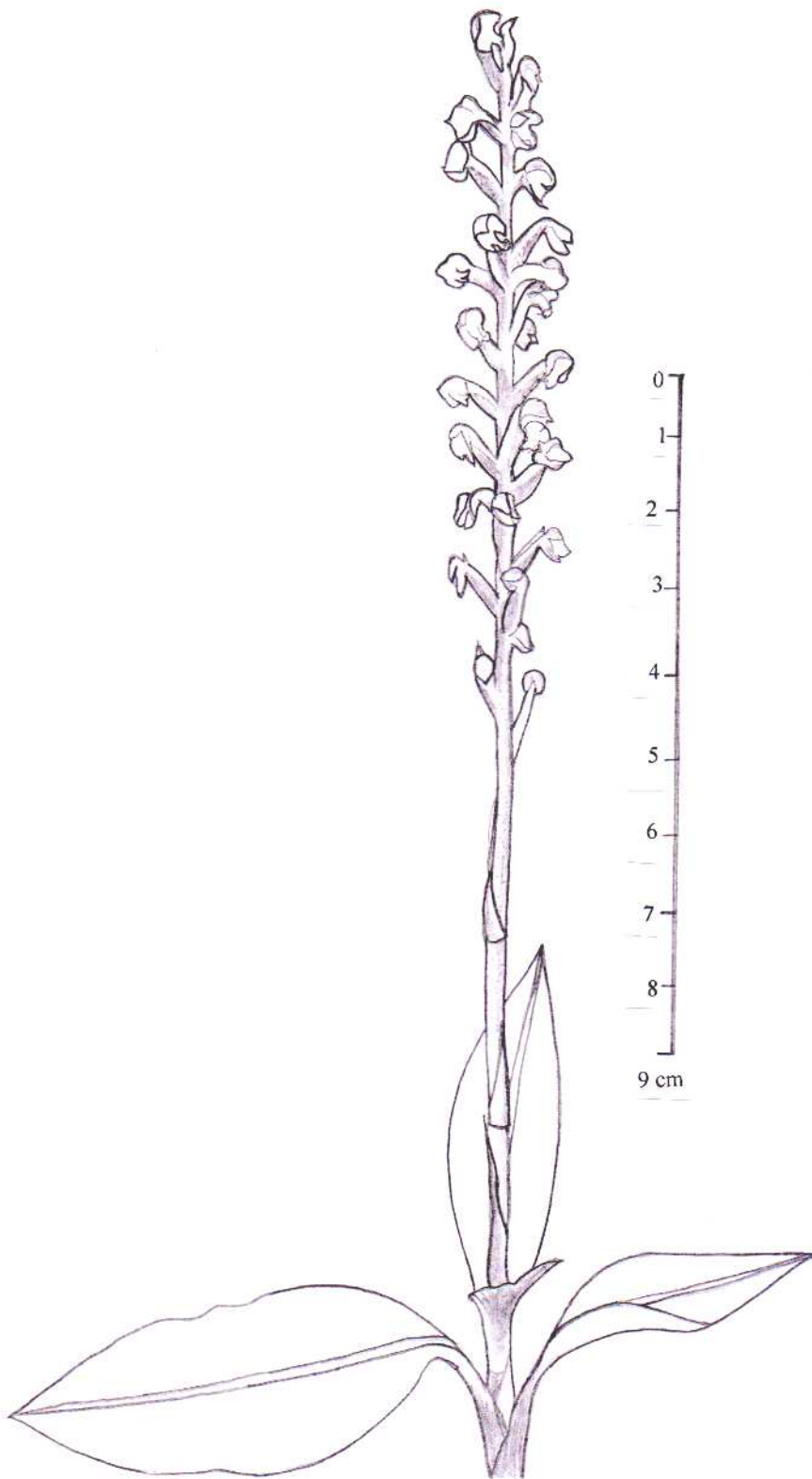


Fig. 4.4: *Rhomboda lanceolata* (Lindl.) Ormerod; A plant with inflorescence.

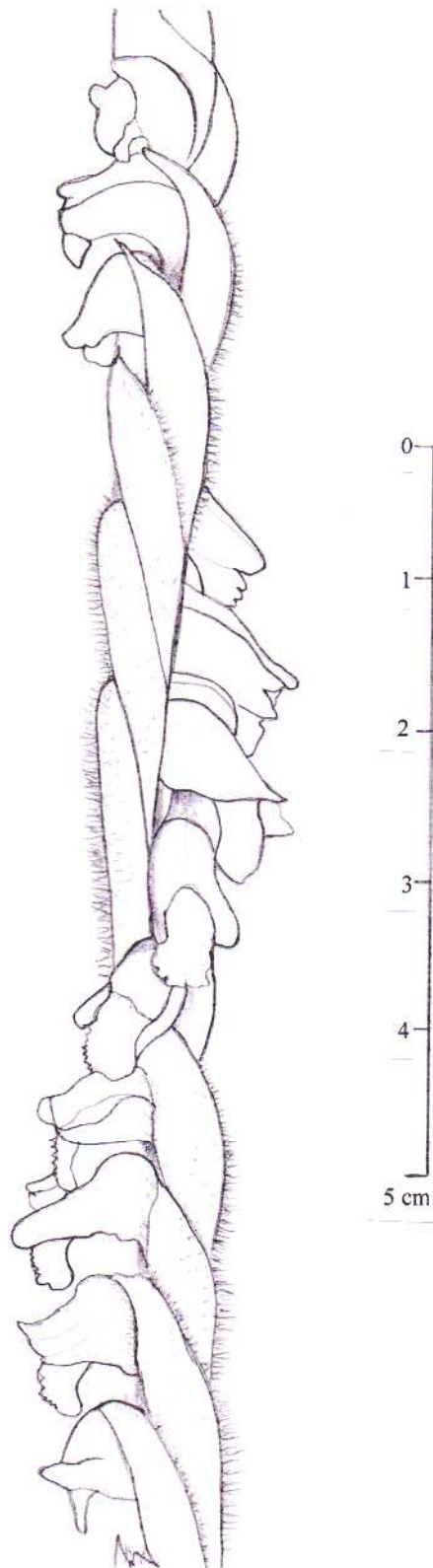


Fig. 4.5: *Spirentes sinensis* (Pers.) Ames; Close up view of inflorescence.

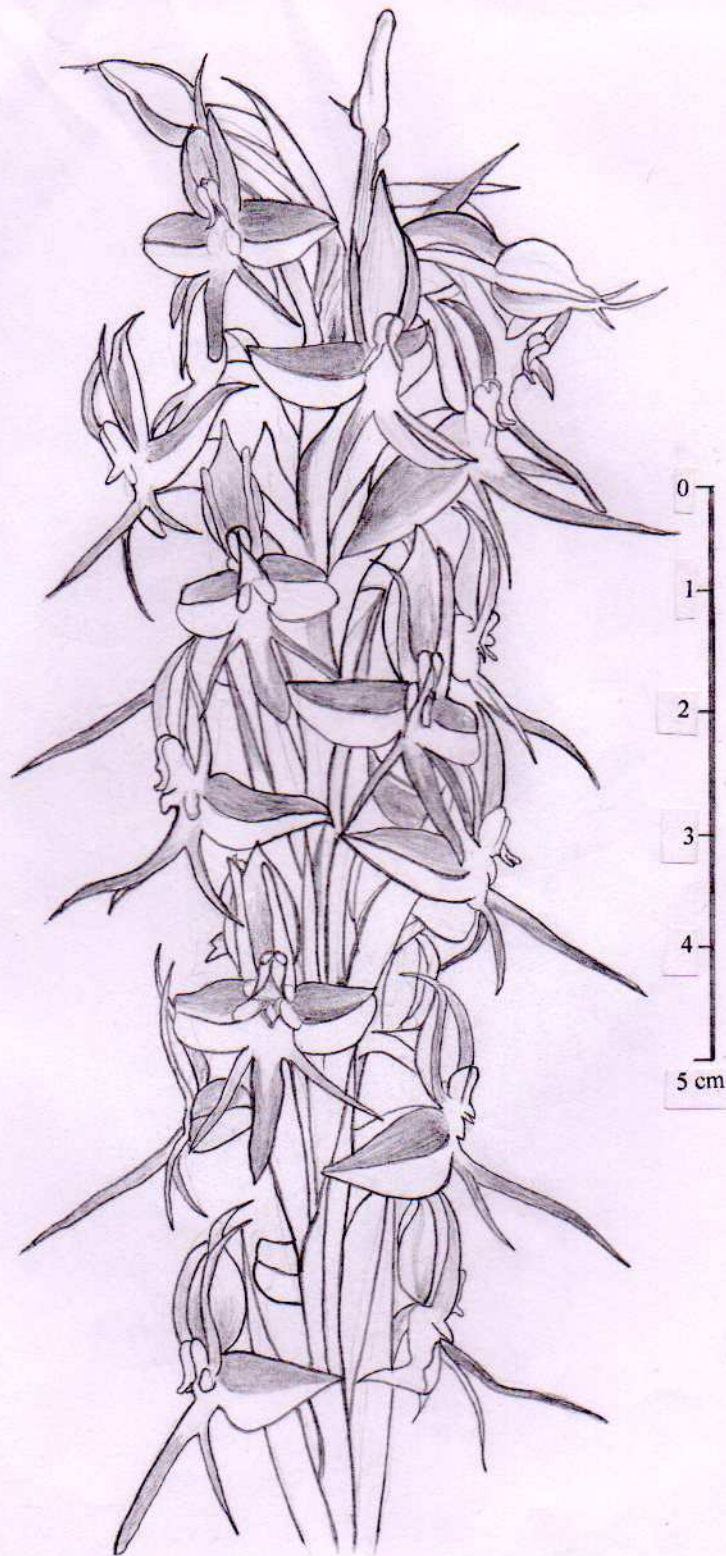


Fig. 4.6: *Habenaria stenopetala* Lindl.; Close up view of inflorescence.

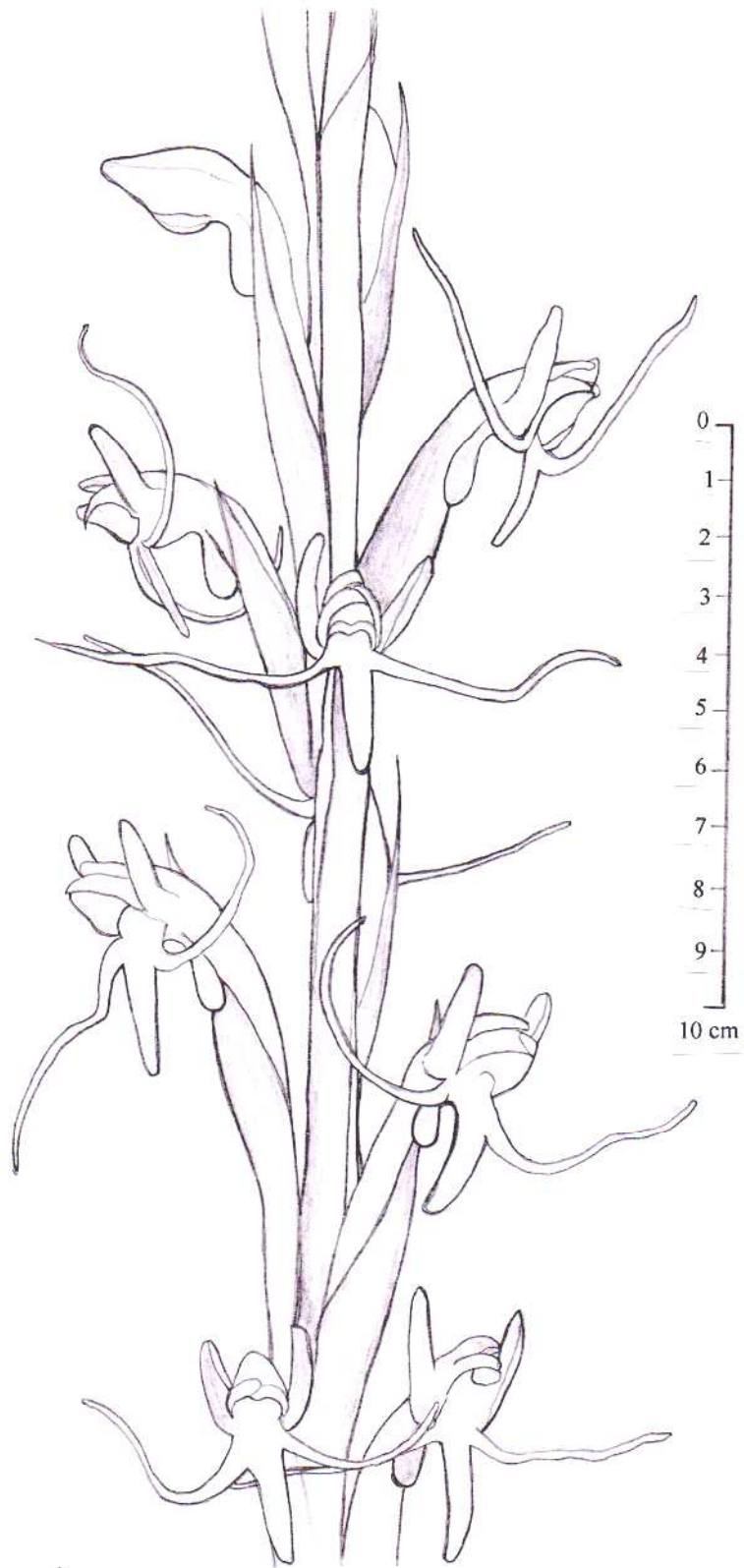


Fig. 4.7: *Peristylus tipuliferus* (Par. & Rchb. f.) Mukerjee; Close up view of inflorescence.

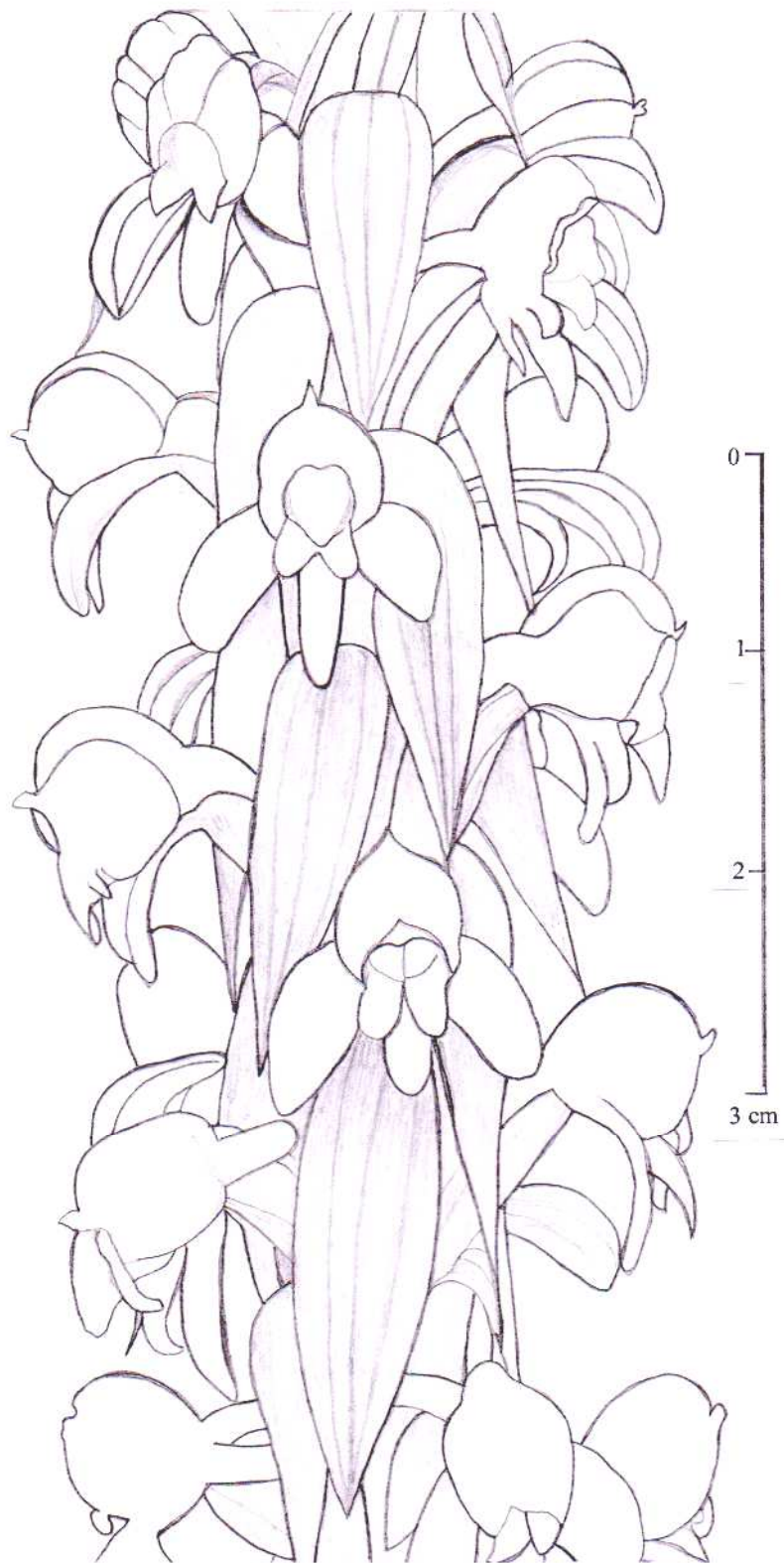


Fig. 4.8: *Satyrium nepalense* D. Don, var. *nepalense*; Close up view of inflorescence.

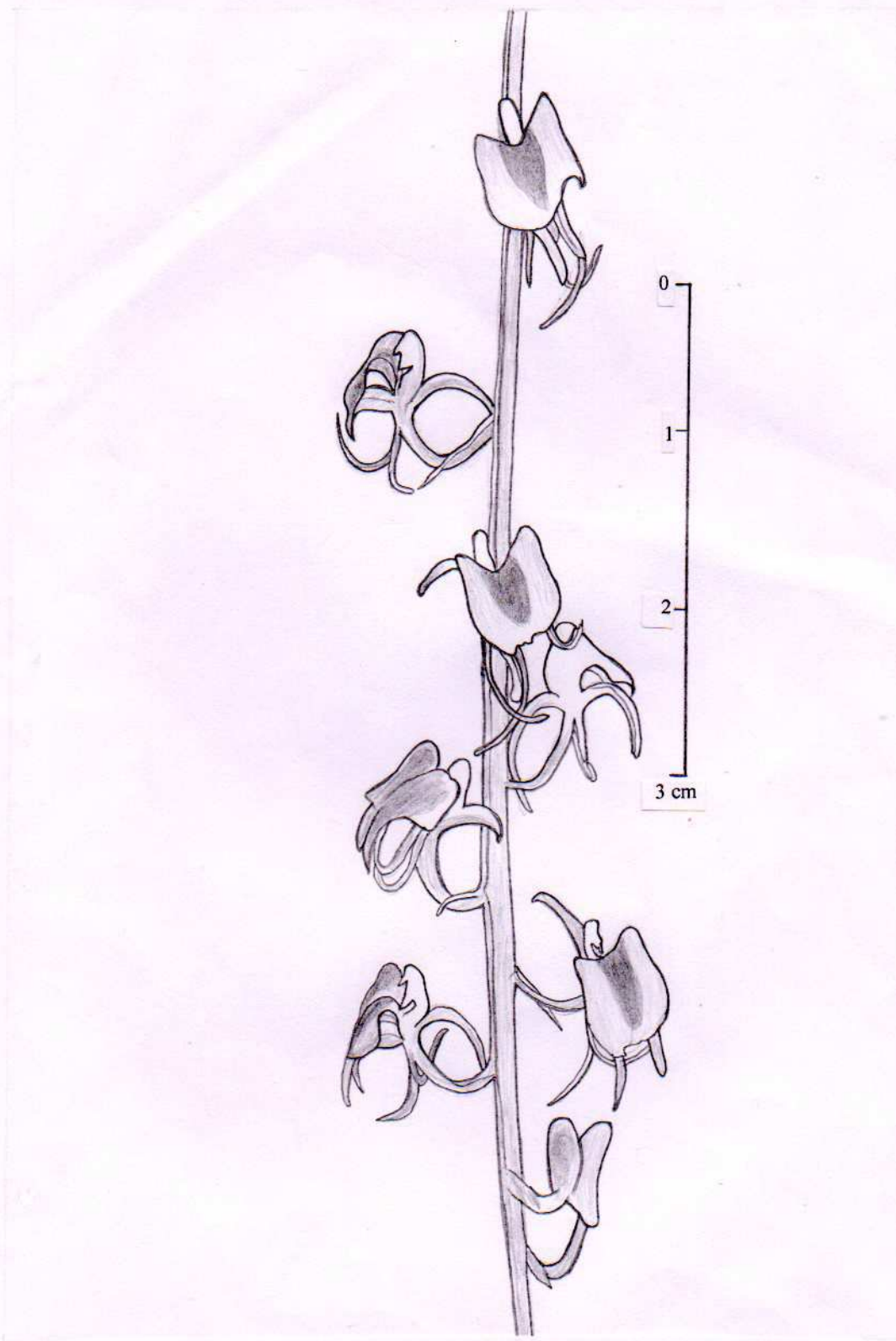


Fig. 4.9: *Liparis bootanensis* Griff.; Close up view of inflorescence.

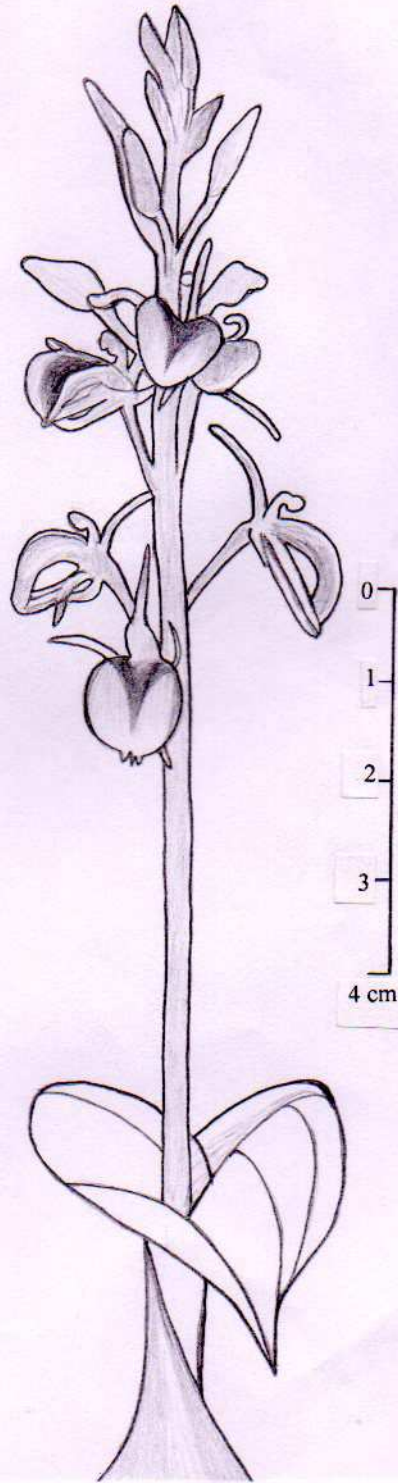


Fig. 4.10: *Liparis cordifolia* Hook. f.; A Plant with inflorescence.

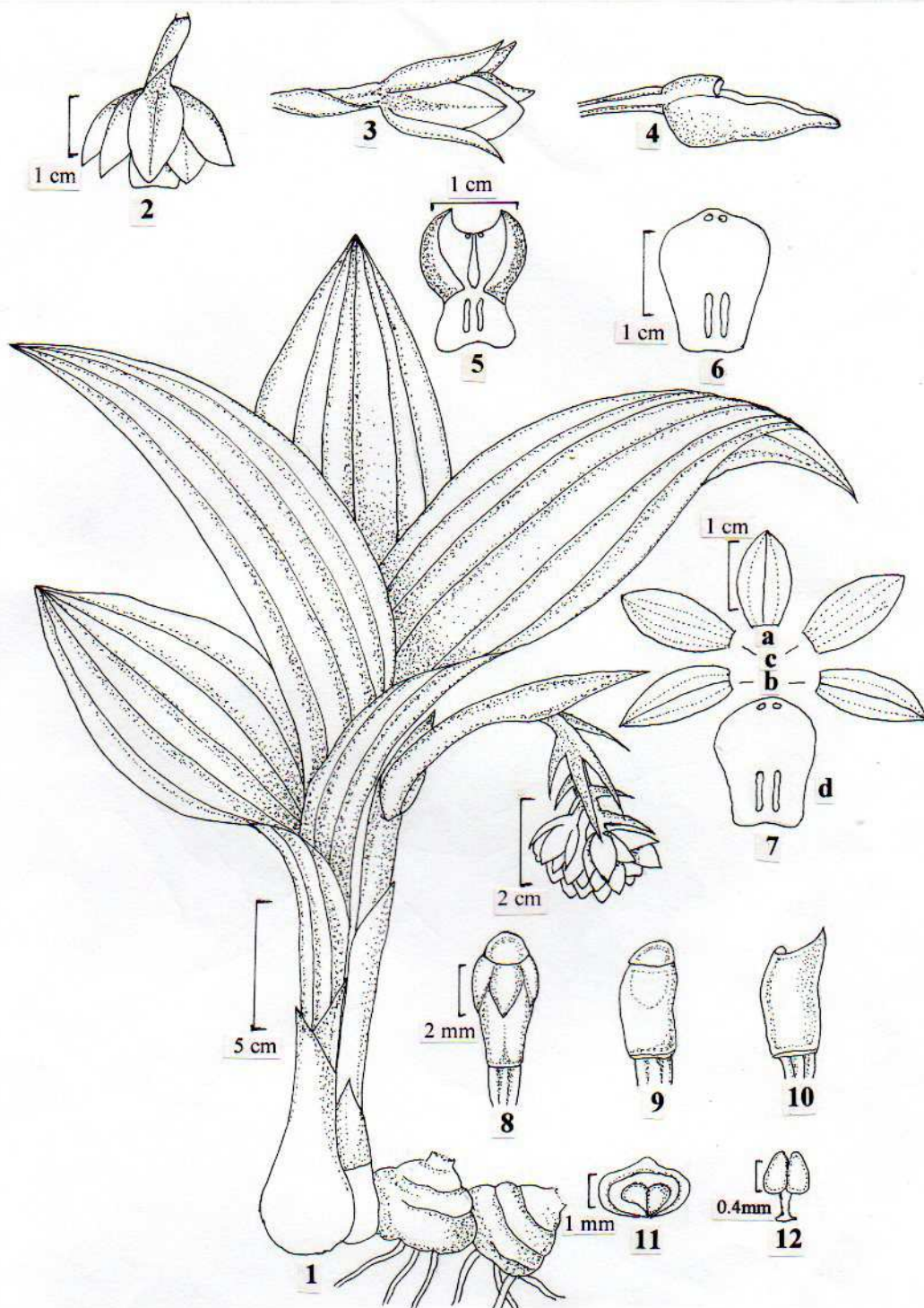


Fig. 4.11: *Geodorum densiflorum* (Lamk.) Schltr. var. *kalimpongense* Rajendra Yonzone *et al.* 1. Habit (Whole plant with inflorescence); 2. Single flower with pedicellate ovary and floral bract (top view) 3. Single flower side view; 4. Side view of ovary, column and lip; 5. Lip (top view); 6. Lip (expanded); 7. Floral perigone, a. dorsal sepal, b. lateral sepals c. petals, d. lip; 8. and 9. Different views of apex of ovary, column with anther; 10. Apex of ovary and column; 11. Anther; 12. Pollinia.

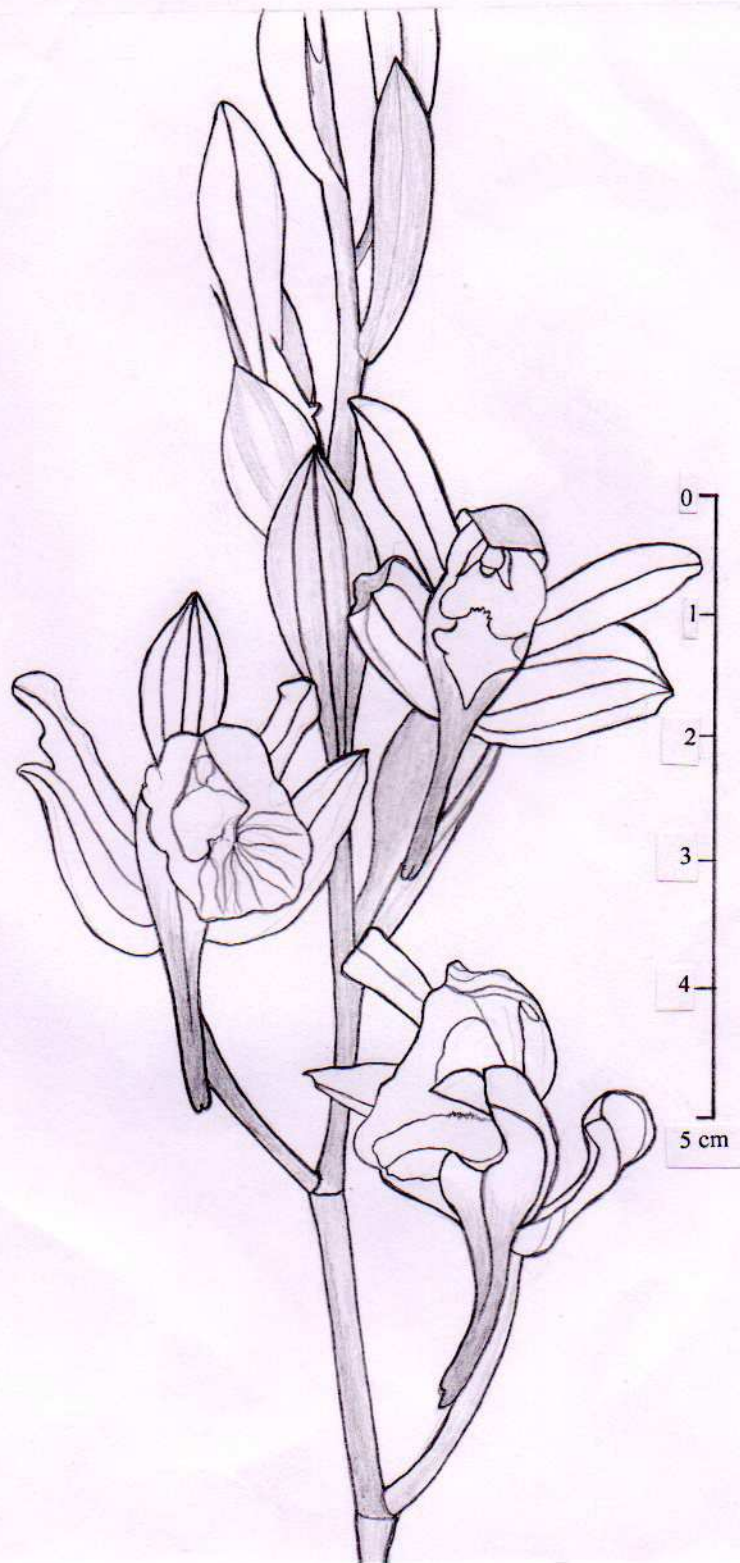


Fig. 4.12: *Phaius mishmensis* (Lindl. & Paxt.) Rchb. f.; Close up view of inflorescence.

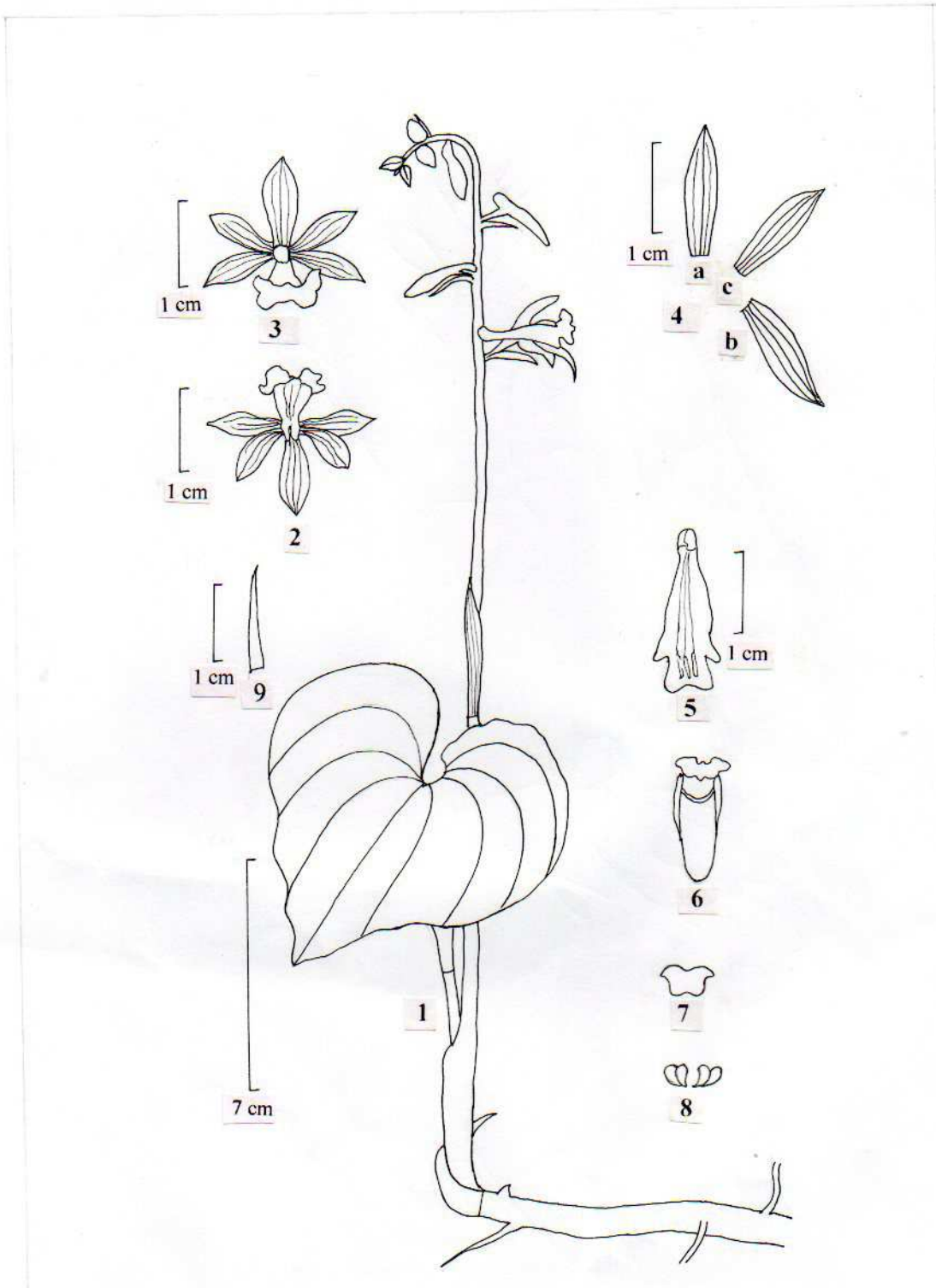


Fig. 4.13: *Nephelaphyllum cordifolium* Lindl. 1. Habit (whole plant with inflorescence); 2. & 3. Different views of flower; 4. a. dorsal sepal, b. lateral sepal and c. petal; 5. Lip; 6. Column; 7. Anther; 8. Pollinia.

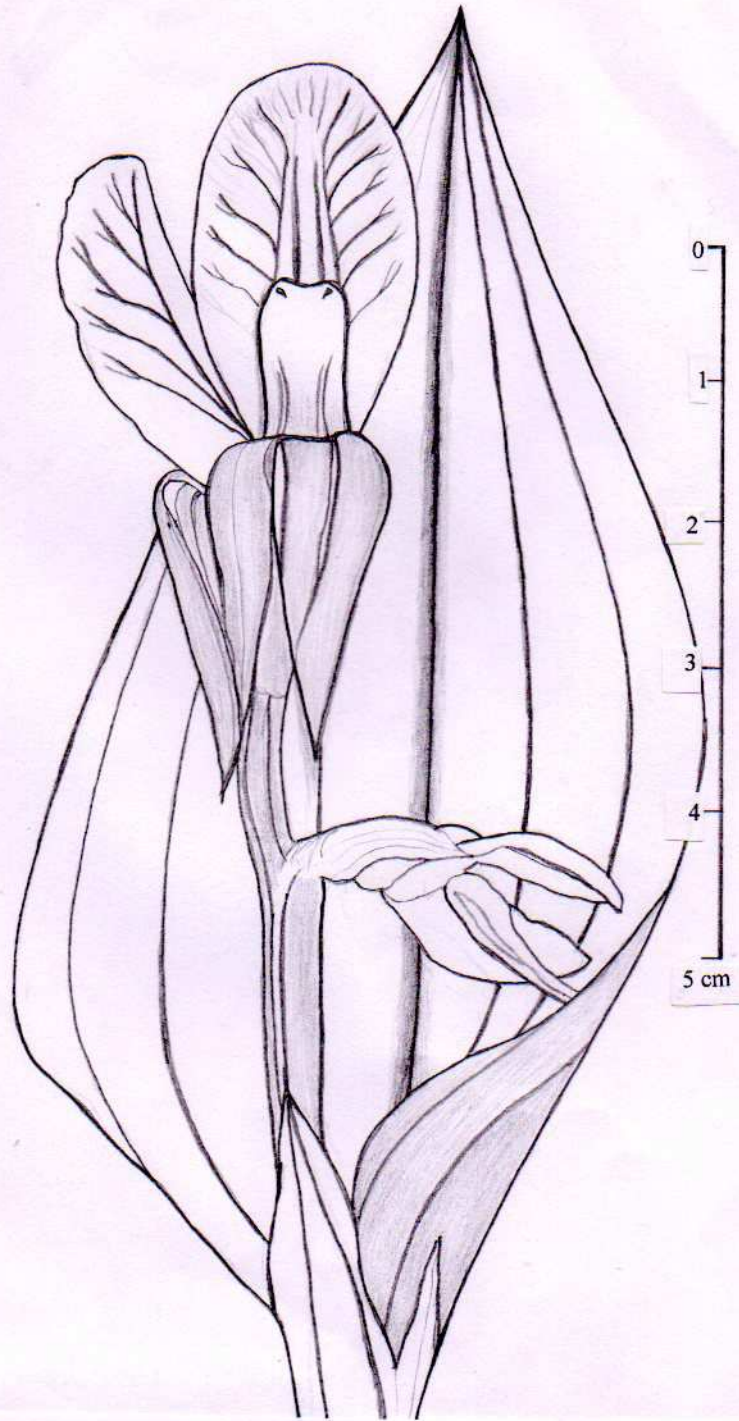


Fig. 4.14: *Nephelaphyllum pulchrum* Bl. var. *sikkimensis* Hook. f.; Upper portion of plant with inflorescence.

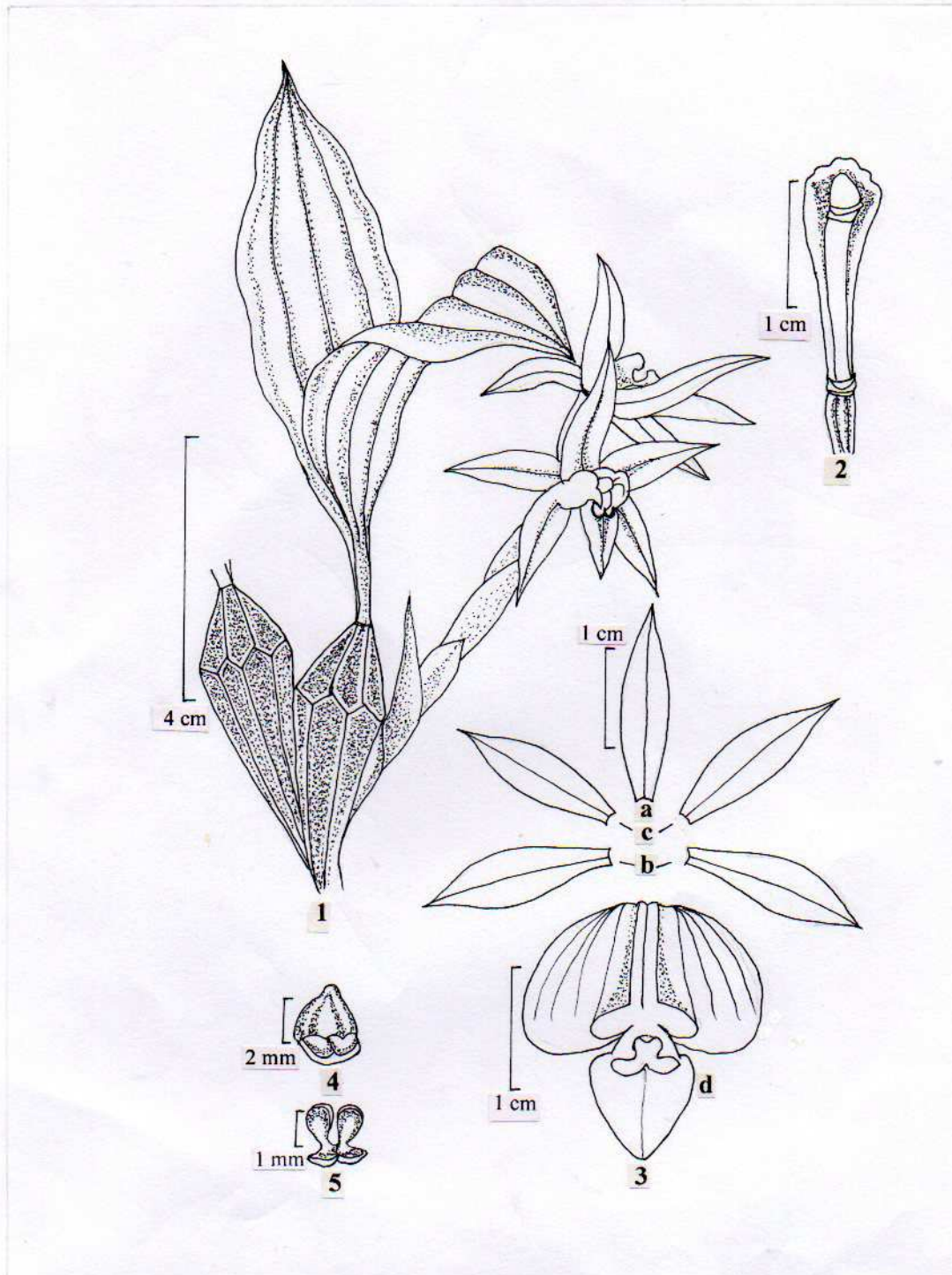


Fig. 4.15: *Coelogyne occultata* Hook. f. 1. Habit (a plant with mature flowers); 2. Front view of the tip of ovary and the column with anther; 3. Floral perigone, a. dorsal sepal, b. lateral sepals, c. petals and d. lip; 4. Anther; 5. Pollinia.

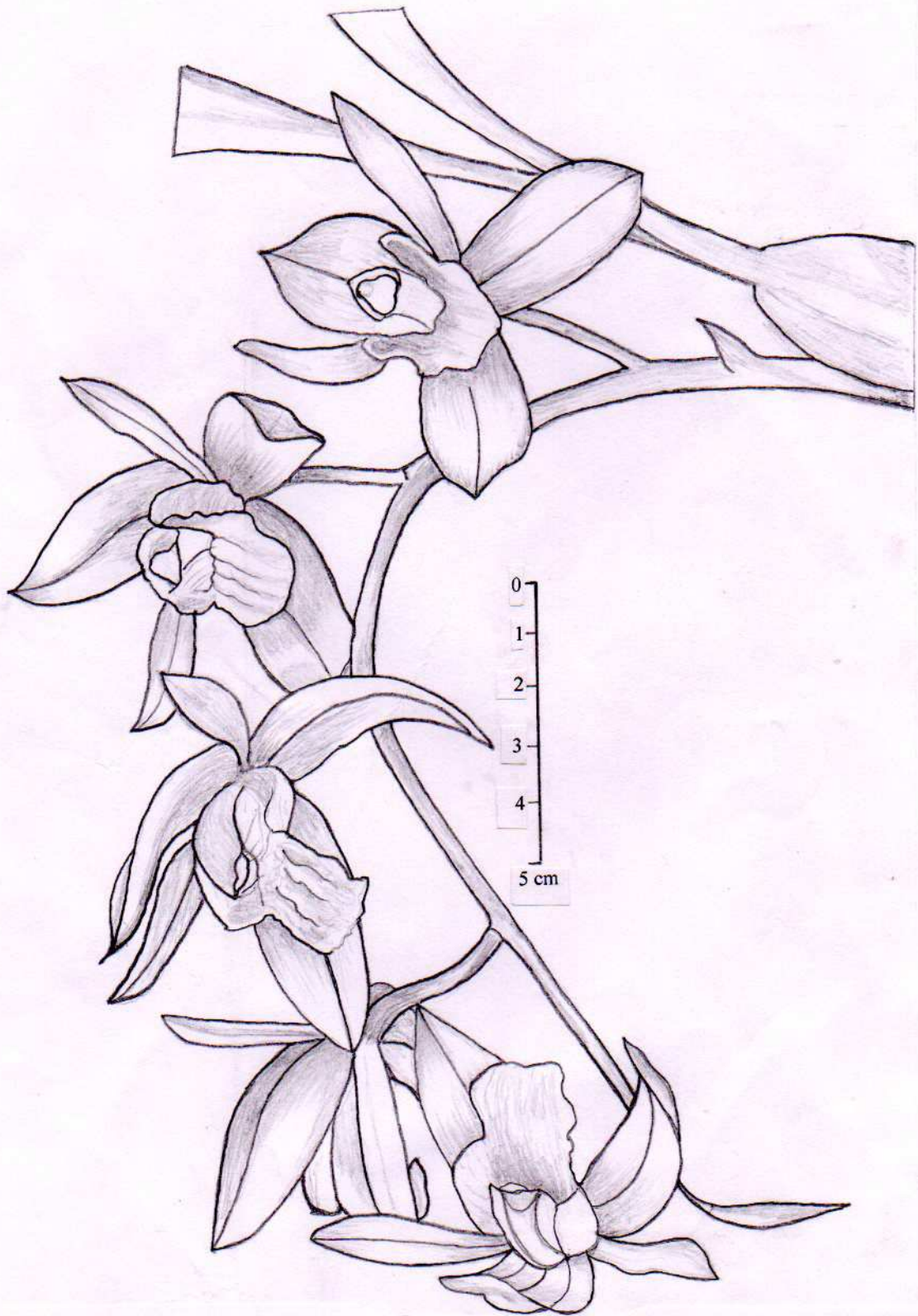


Fig. 4.16: *Coelogyne pempahesiana* H.J. Chowdhery; Close up view of inflorescence.

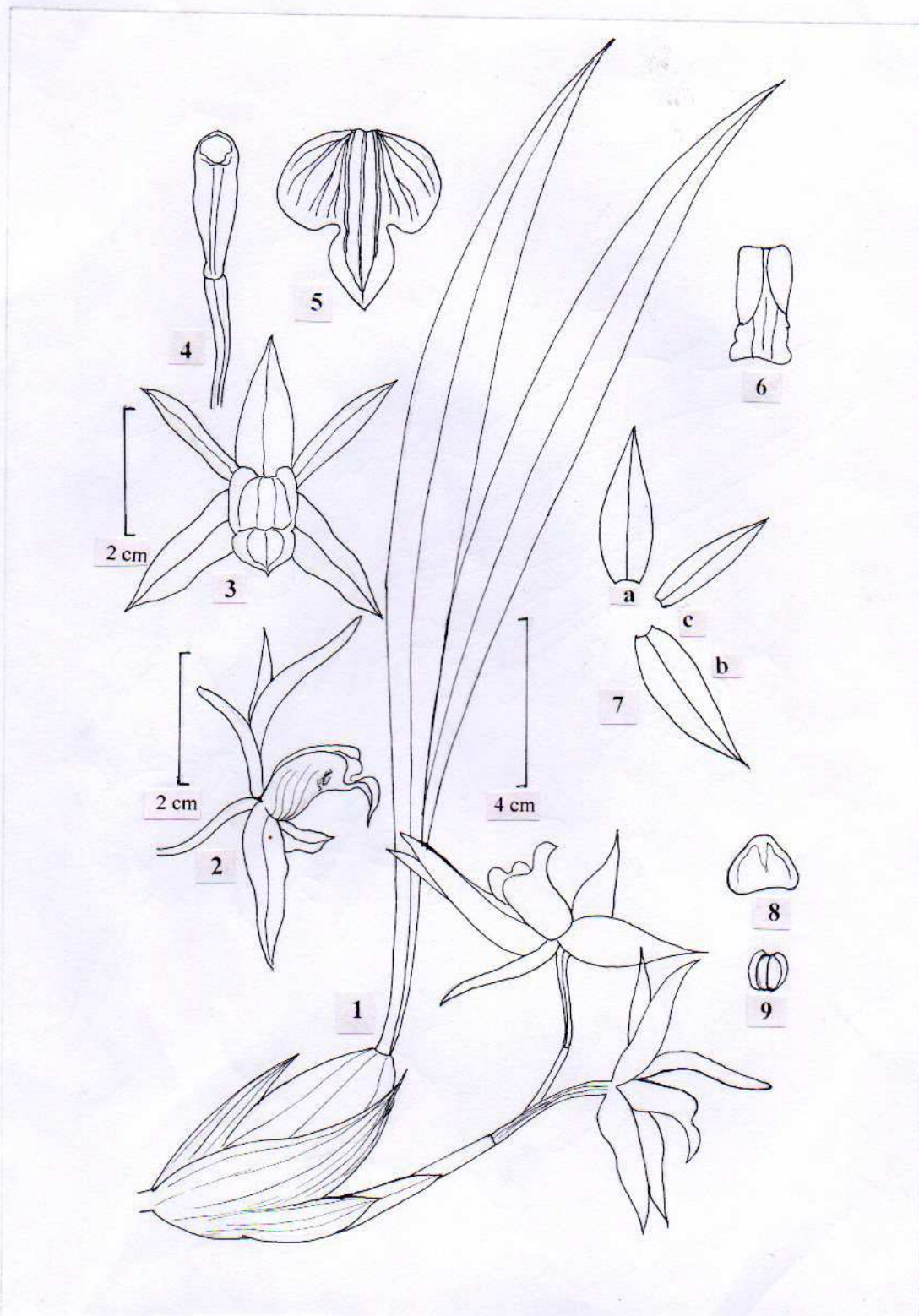


Fig. 4.17: *Coelogyne viscosa* Reichb. f. 1. Habit (whole plant with inflorescence); 2. Side view of flower; 3. Front view of flower; 4. Pedicellate ovary, column; 5. Flattened view of lip; 6. Top view of lip; 7. a. dorsal sepal, b. lateral sepal and c. petal; 8. Anther; 9. Pollinia.

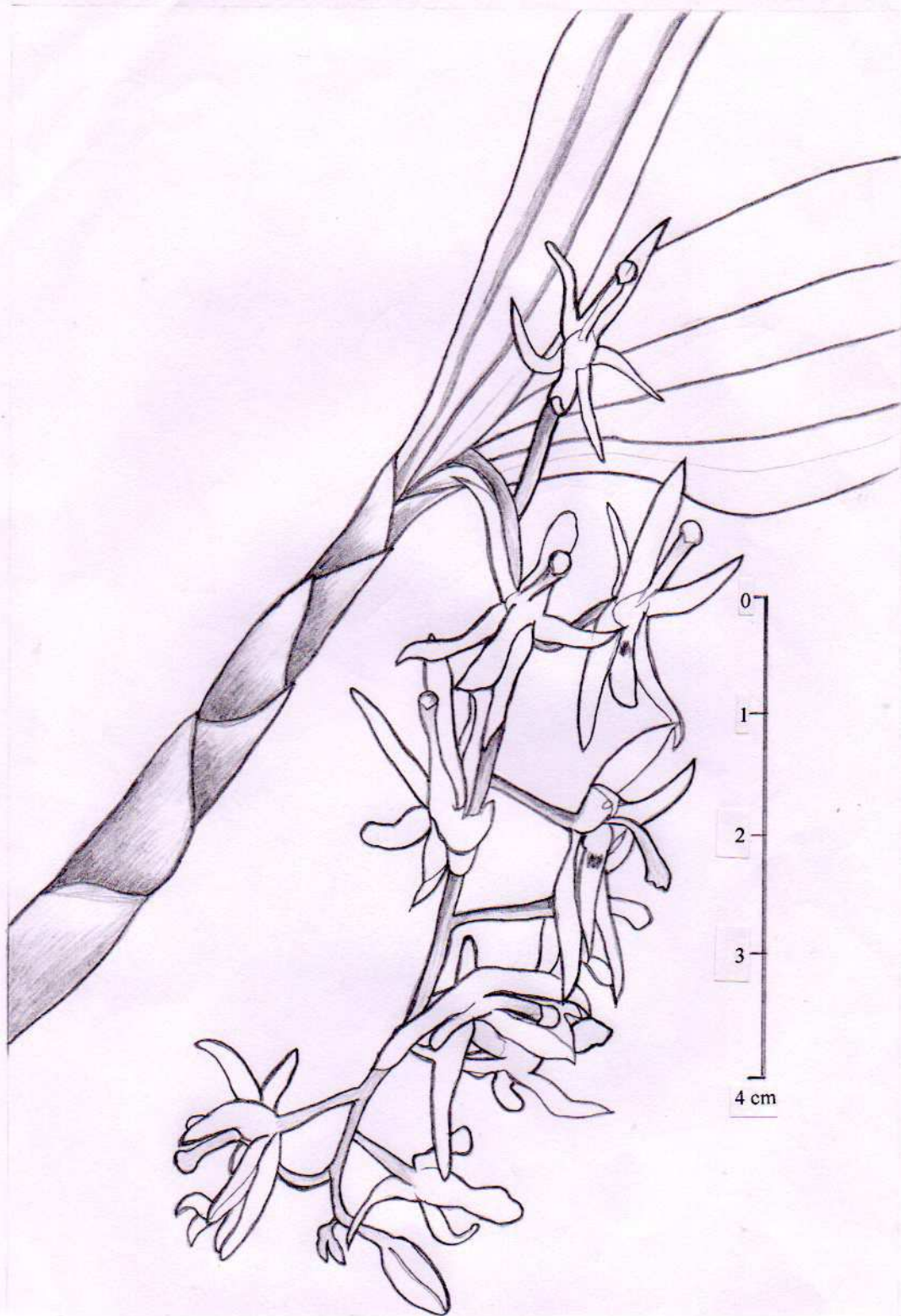


Fig. 4.18: *Otochilus albus* Lindl.; A portion of plant with inflorescence.

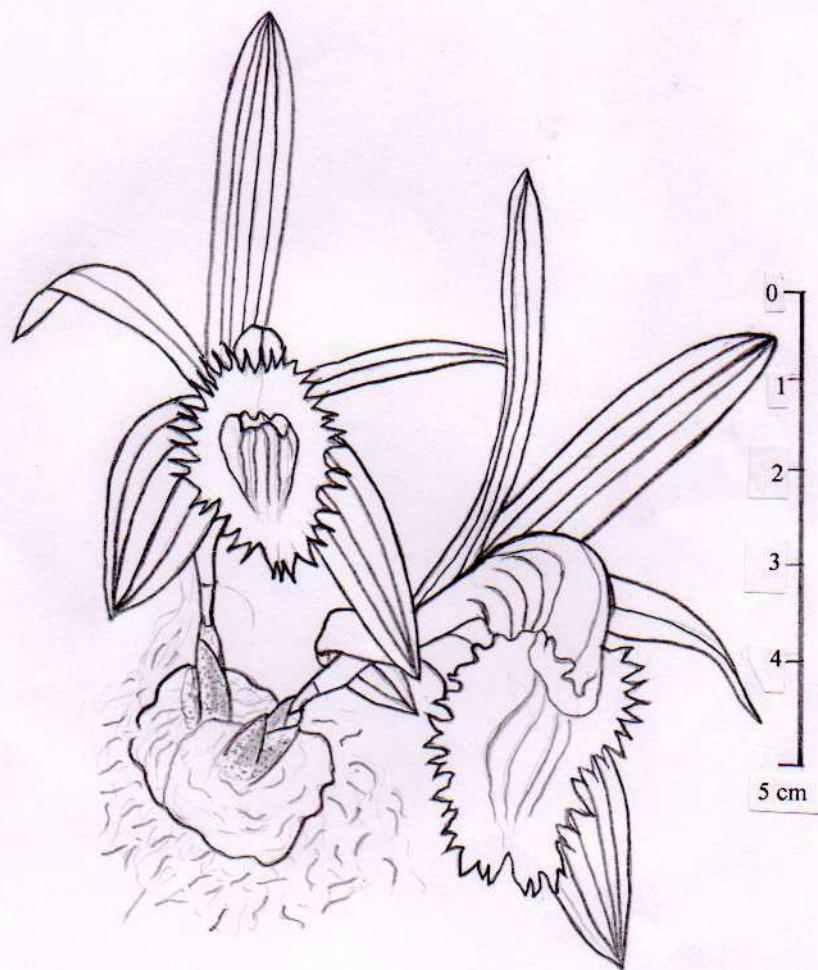


Fig. 4.19: *Pleione praecox* (J.E. Sm.) D. Don; Pseudobulbs with flowers.

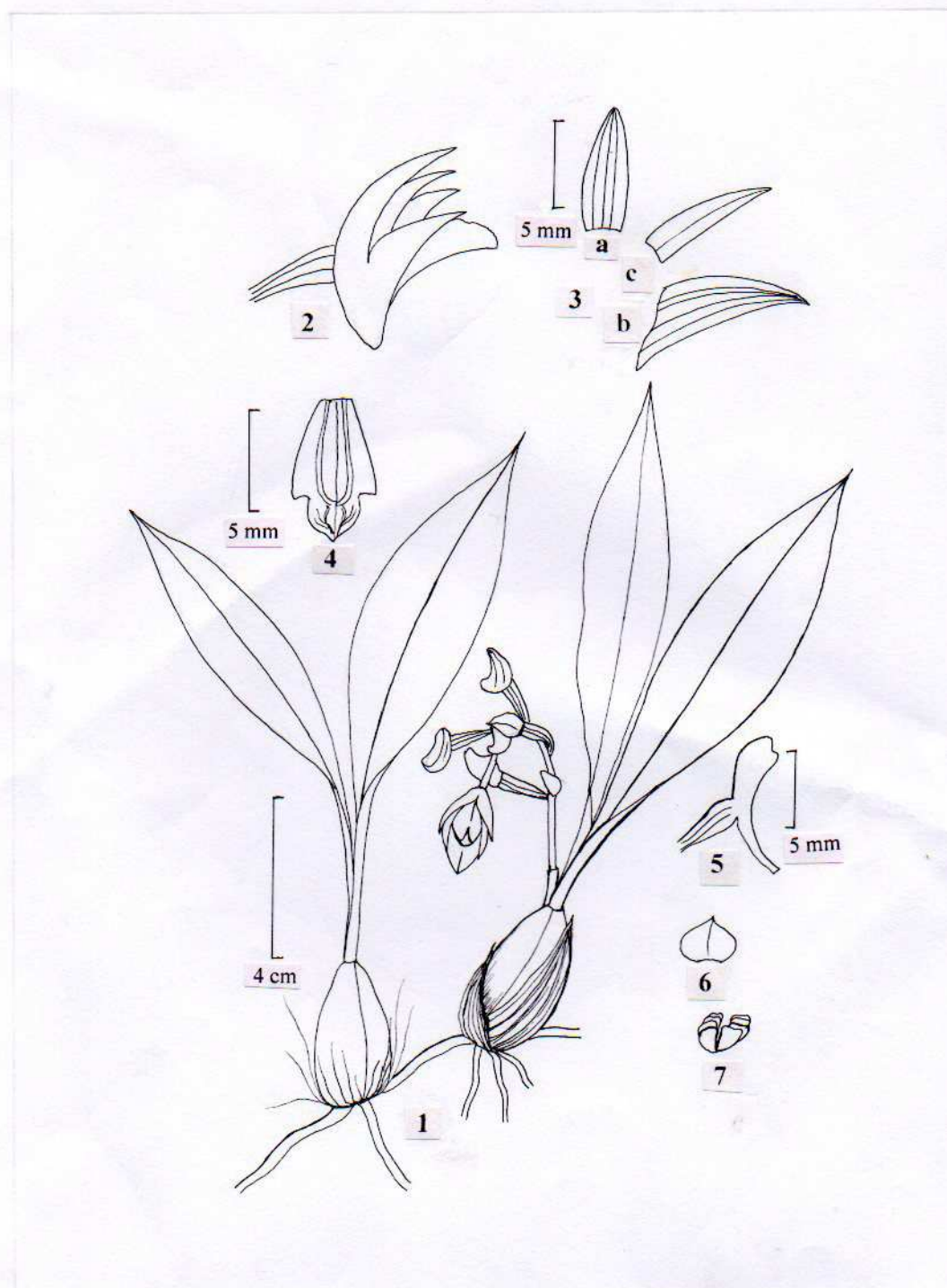


Fig. 4.20: *Eria clausa* King & Pantl. 1. Habit (whole plant with inflorescence); 2. Side view of flower with pedicellate ovary; 3. a. dorsal sepal, b. lateral sepal and c. petal; 4. Flattened view of lip; 5. Side view of pedicellate ovary, column and mentum foot; 6. Anther; 7. Pollinia.

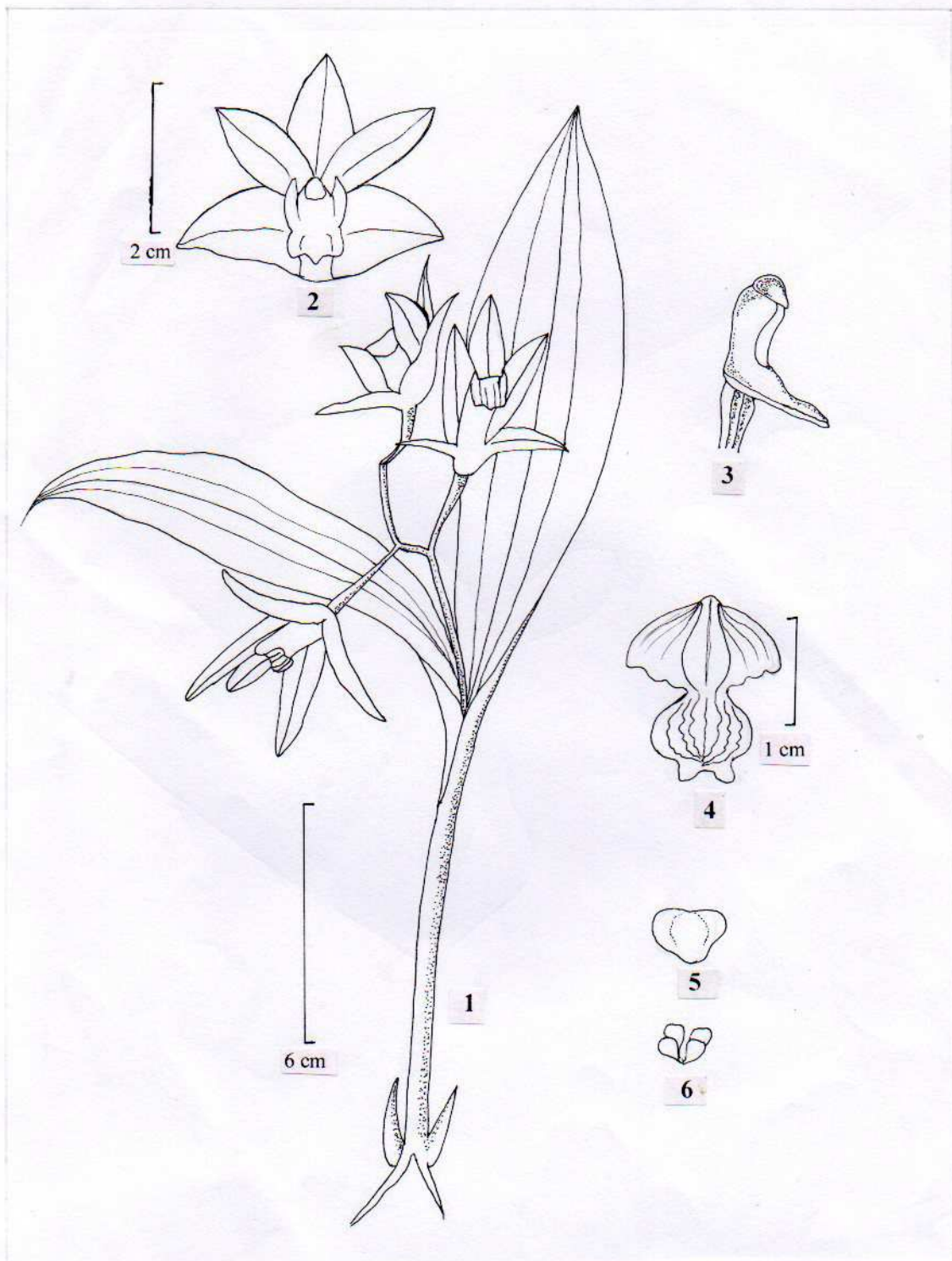


Fig. 4.21: *Eria coronaria* (Lindl.) Reichb. f. 1. Habit (whole plant with inflorescence); 2. Front view of flower; 3. Side view of column, tip of pedicellate ovary, anther; 4. Flattened view of lip; 5. Anther; 6. Pollinia.

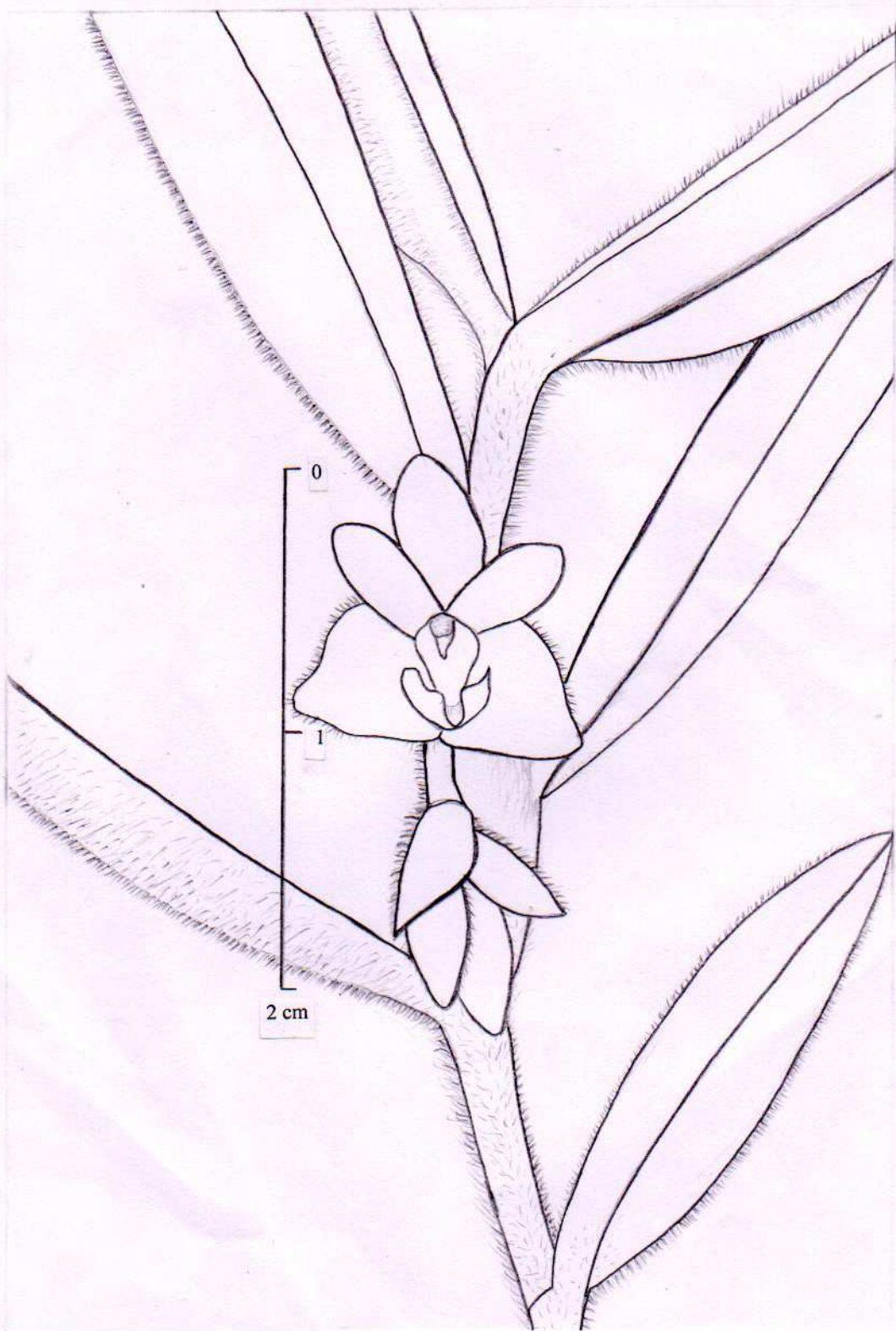


Fig. 4.22: *Trichotosia pulvinata* (Lindl.) Kranz.; A portion of plant with inflorescence.

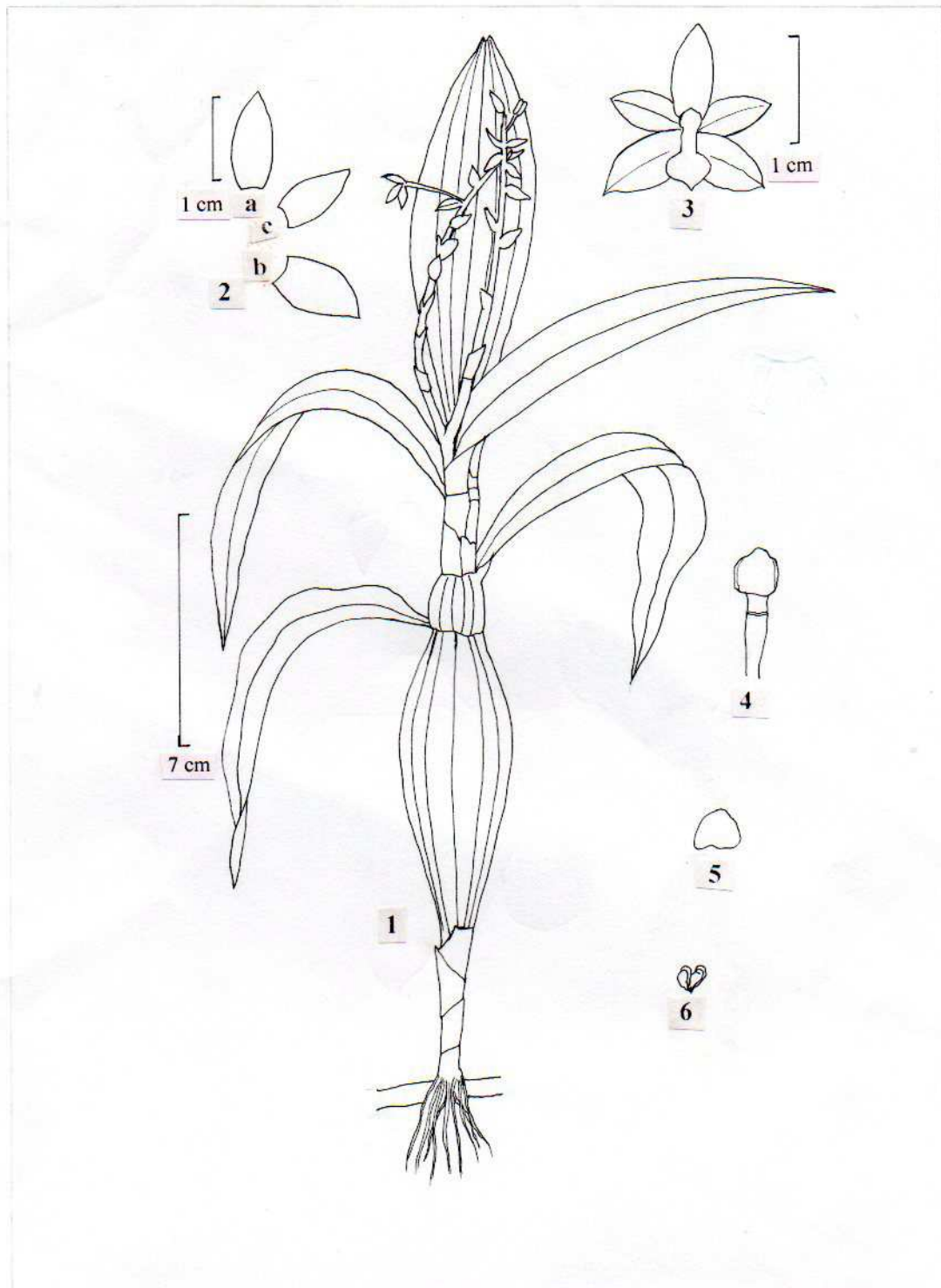


Fig. 4.23: *Tylostylis discolor* (Lindl.) Hook. f. 1. Habit (whole plant with inflorescences); 2. Front view of flower; 3. a. dorsal sepal, b. lateral sepal and c. petal; 4. Pedicellate ovary and column; 5. Anther; 6. Pollinia.

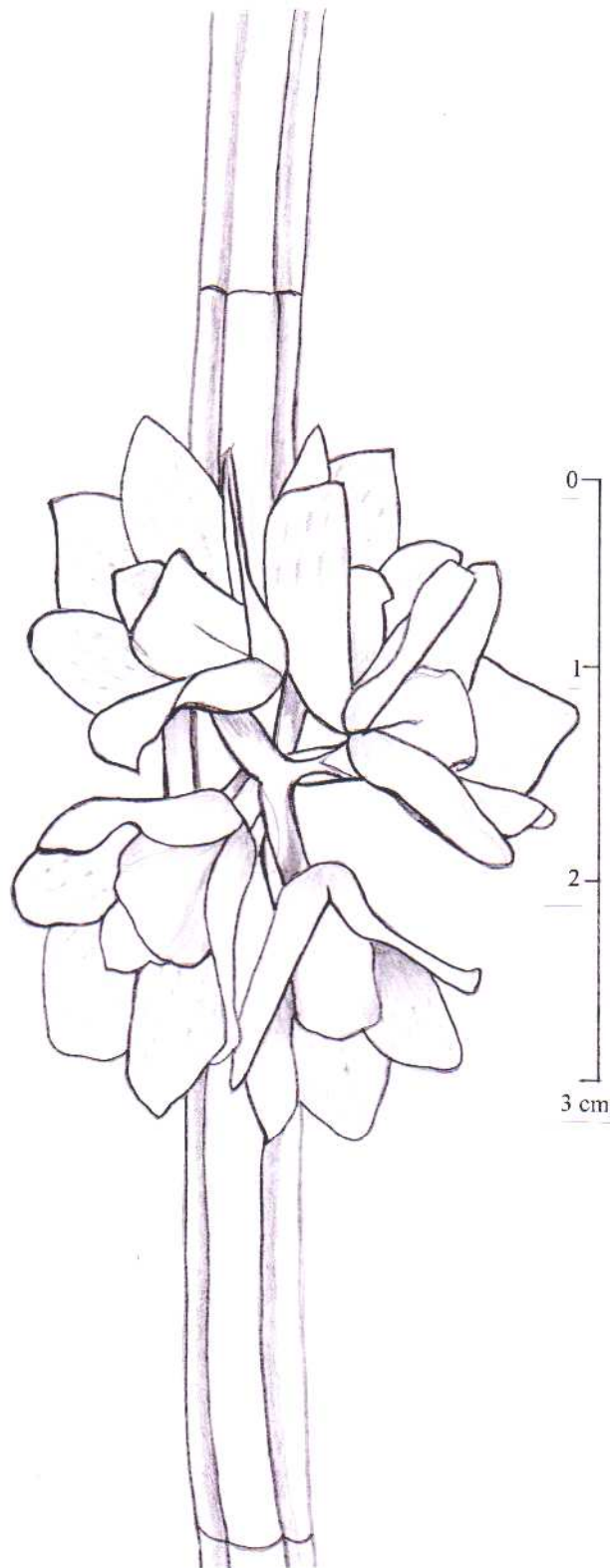


Fig. 4.24: *Dendrobium bicameratum* Lindl.; A portion of pseudostem with inflorescence.

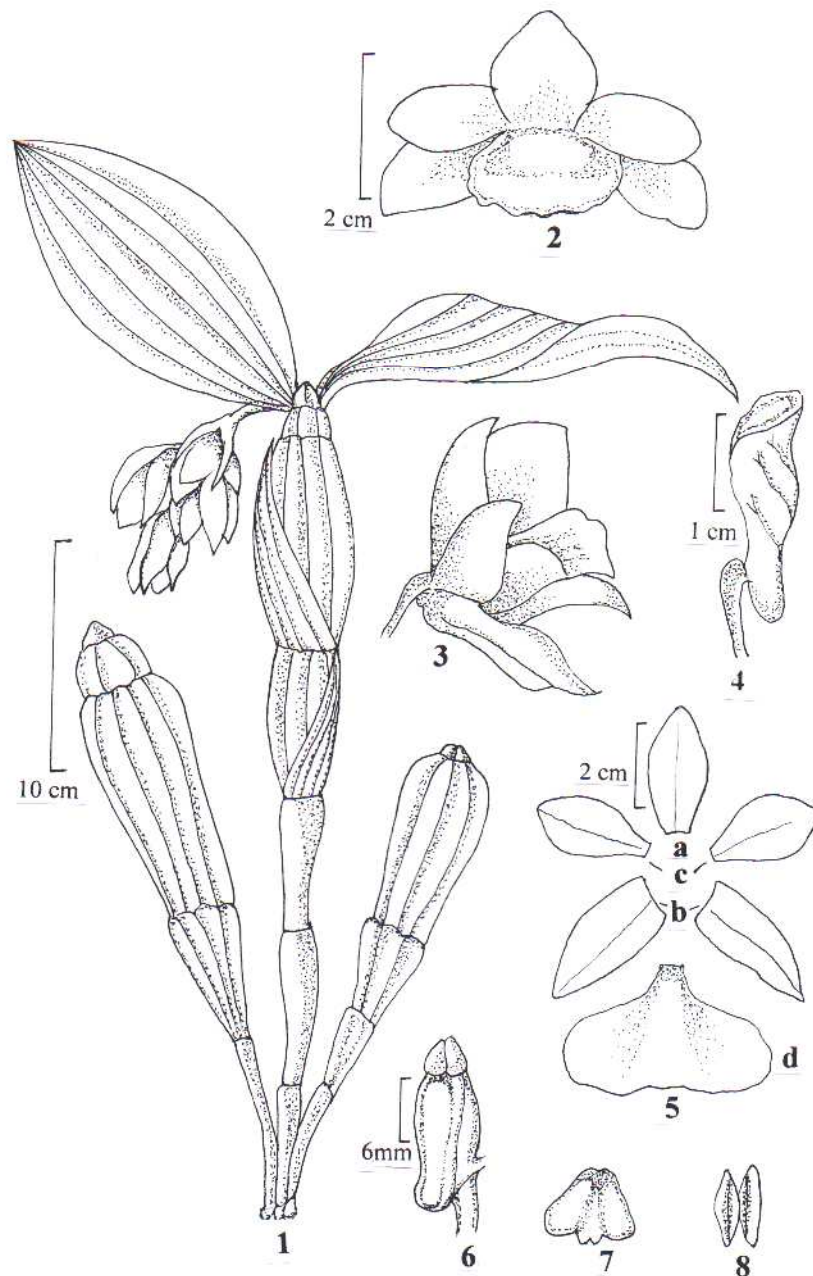


Fig. 4.25: *Dendrobium sulcatum* Lindl. 1. Habit (whole plant with inflorescence); 2. Front view of flower; 3. Side view of flower; 4. Side view of lip; 5. Floral perigone, a. dorsal sepal, b. lateral sepals, c. petals, d. lip; 6. Column with anther; 7. Anther; 8. Pollinia.

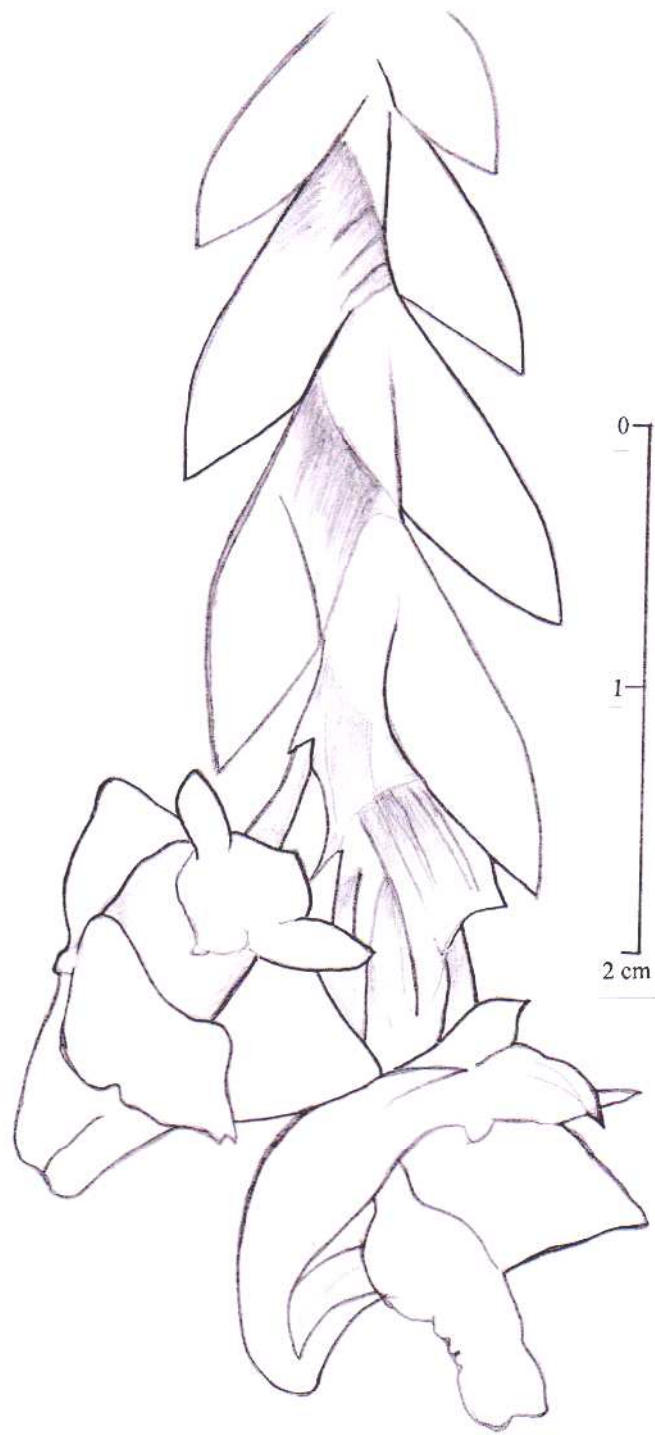


Fig. 4.26: *Dendrobium terminale* Par. & Rchb. f.; A portion of plant with flowers.

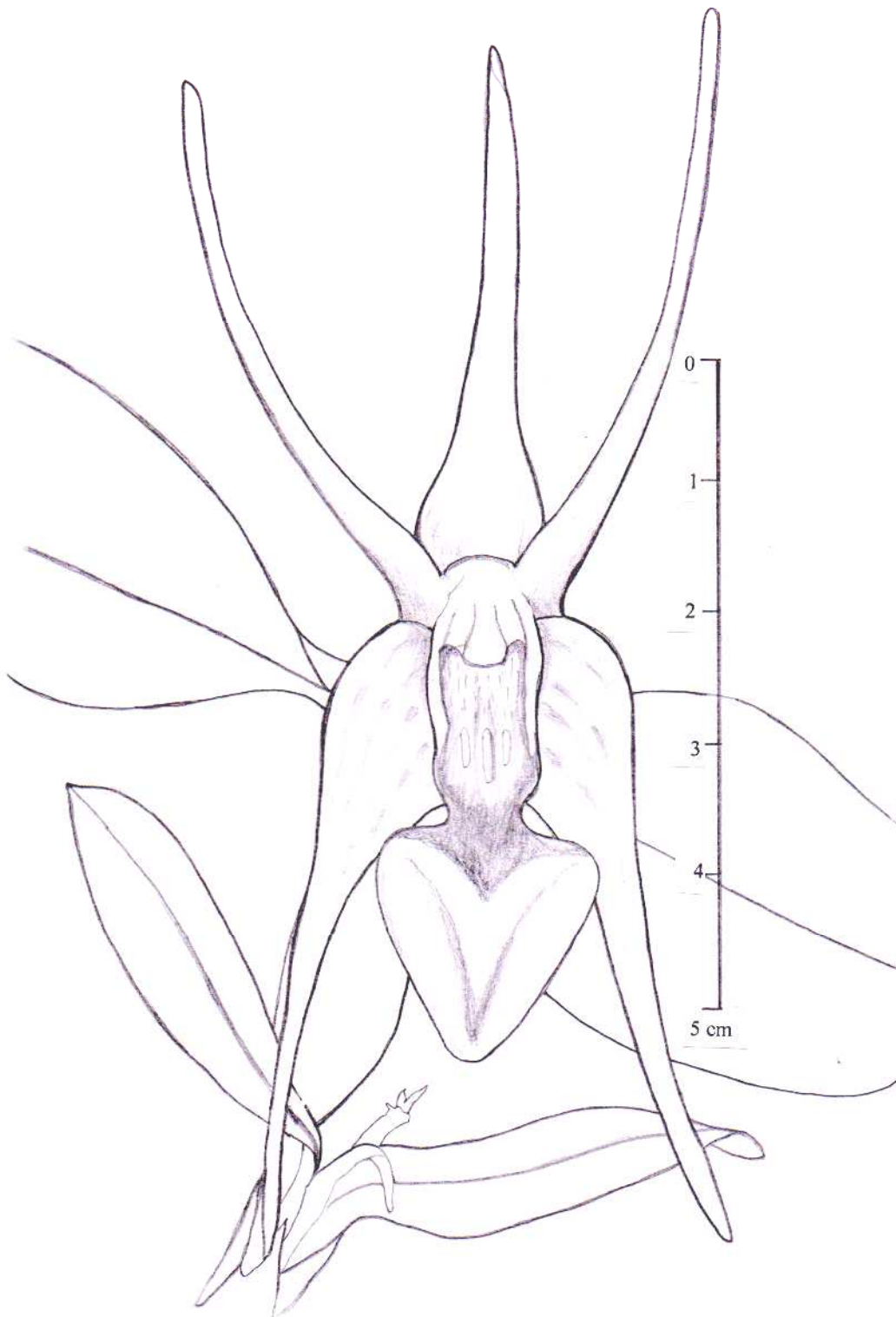


Fig. 4.27: *Epigeneium amplum* (Lindl.) Summerh. Close up view of flower.

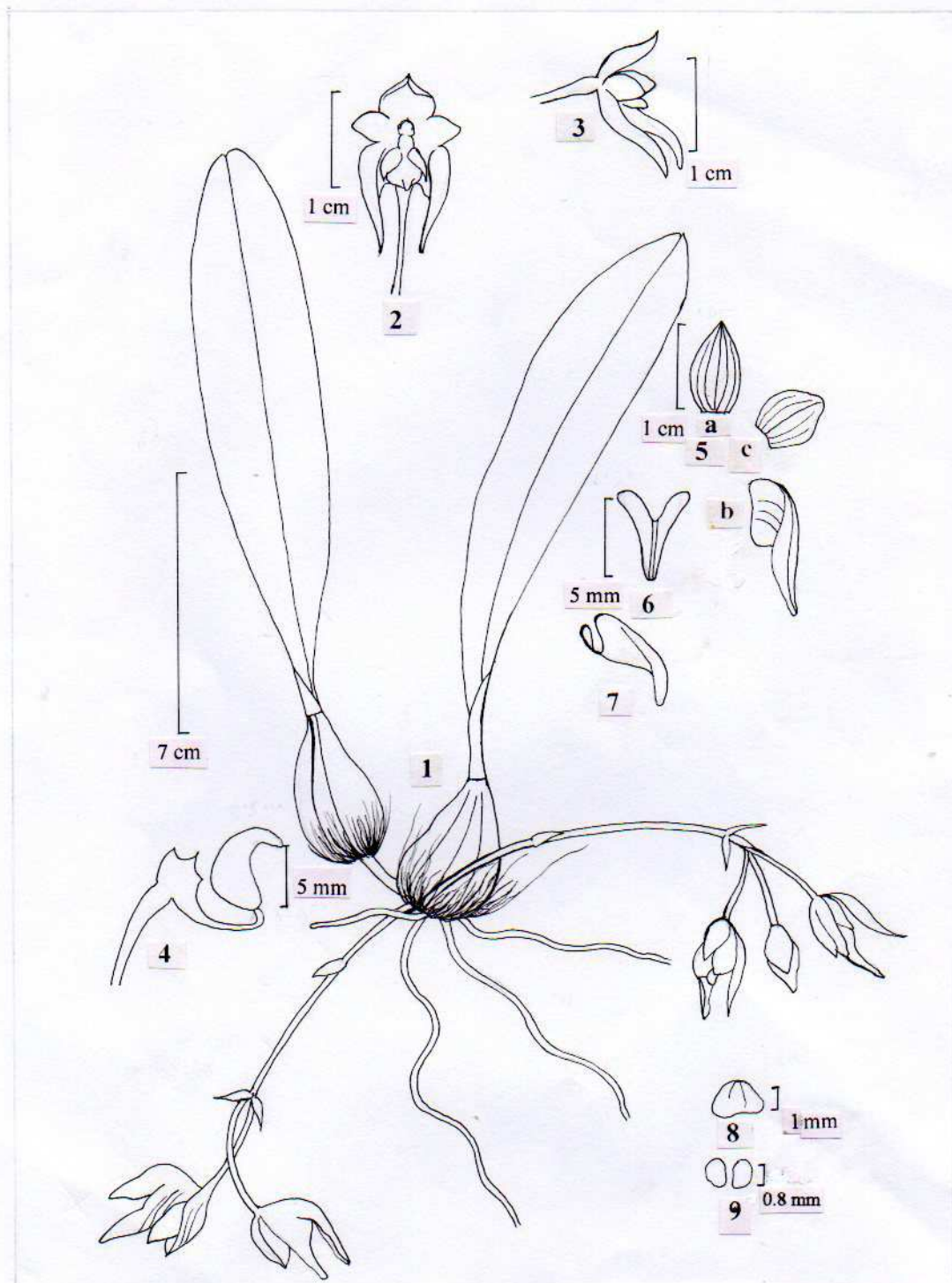


Fig. 4.28: *Bulbophyllum umbellatum* Lindl. 1. Habit (whole plant with inflorescences); 2. Front view of flower with pedicellate ovary; 3. Side view of flower; 4. a. dorsal sepal, b. lateral sepal and c. petal; 5. Front view of lip; 6. Side view of lip; 7. Side view of pedicellate ovary, column, mentum foot and lip; 8. Anther; 9. Pollinia.

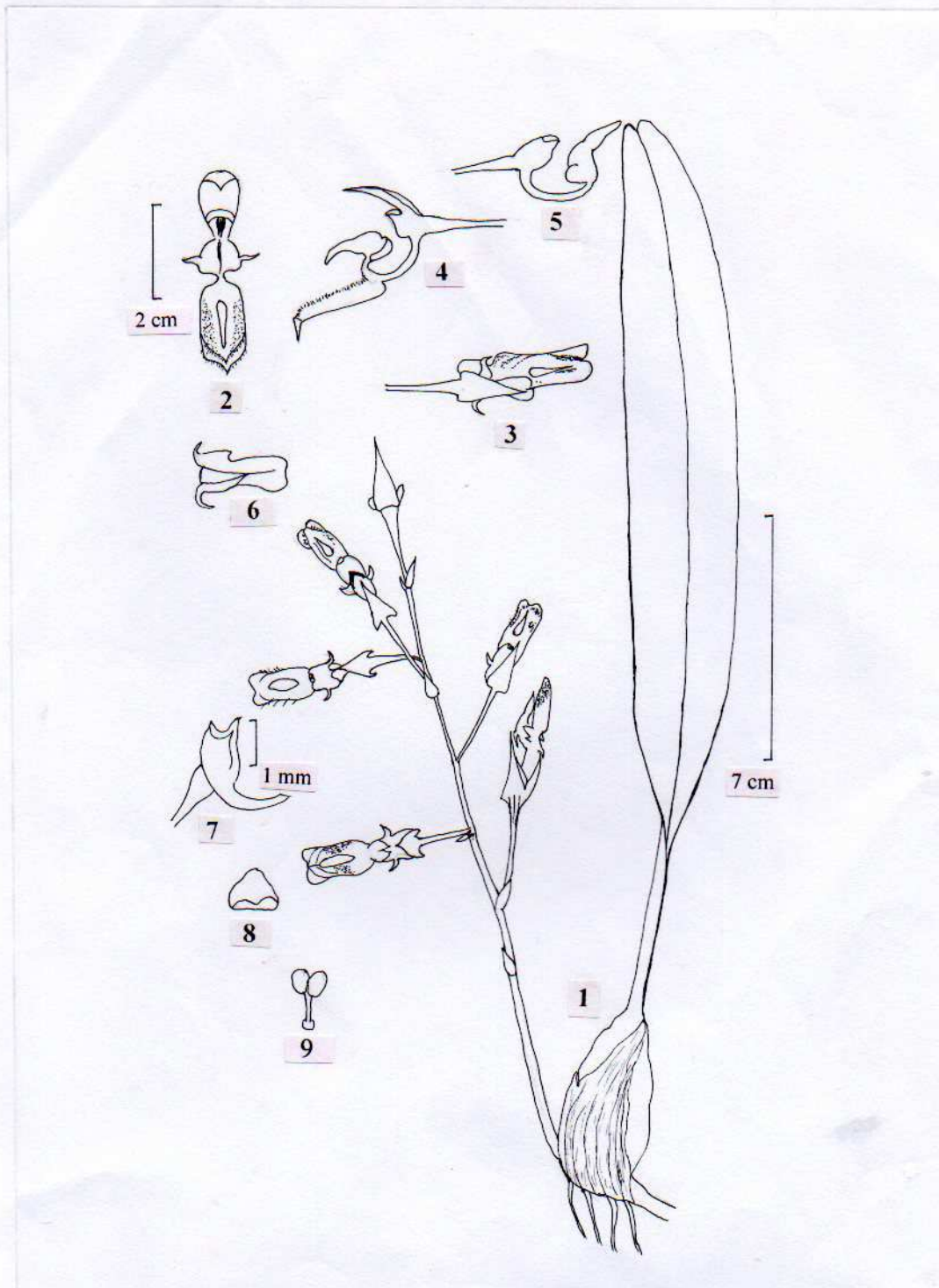


Fig. 4.29: *Monomeria barbata* Lindl. 1. Habit (whole plant with inflorescence); 2. Front view of flower; 3. Side view of flower; 4. Top view of flower; 5. Side view of pedicellate ovary, column, mentum foot and lip; 6. Lip; 7. Side view of pedicellate ovary, column and mentum foot; 8. Anther; 9. Pollinia.

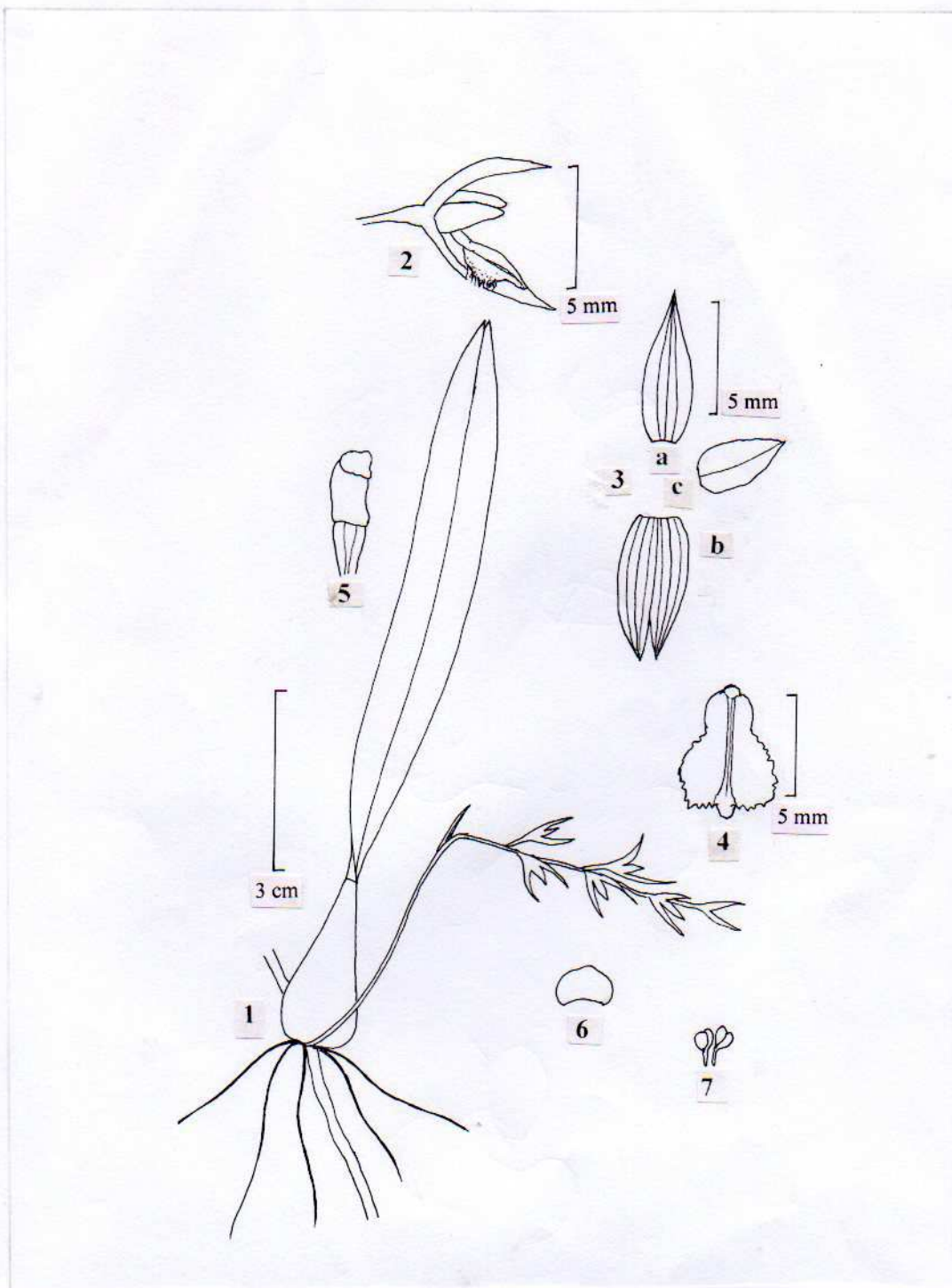


Fig. 4.30: *Sunipia bicolor* (Lindl.) Lindl. 1. Habit (whole plant with inflorescence); 2. Side view of flower; 3. a. dorsal sepal, b. lateral sepal and c. petals; 4. Flattened view of lip; 5. Tip of pedicellate ovary, column with anther; 6. Anther; 7. Pollinia.

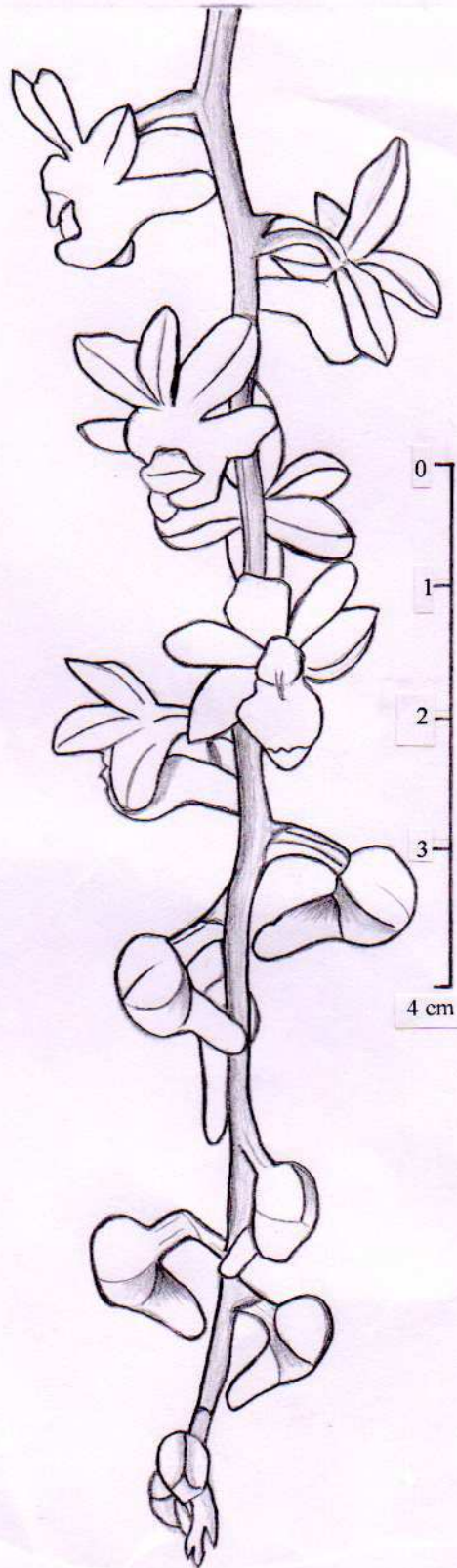


Fig. 4.31: *Cleisostoma aspersum* (Rchb. f.) Garay; A portion of inflorescence.

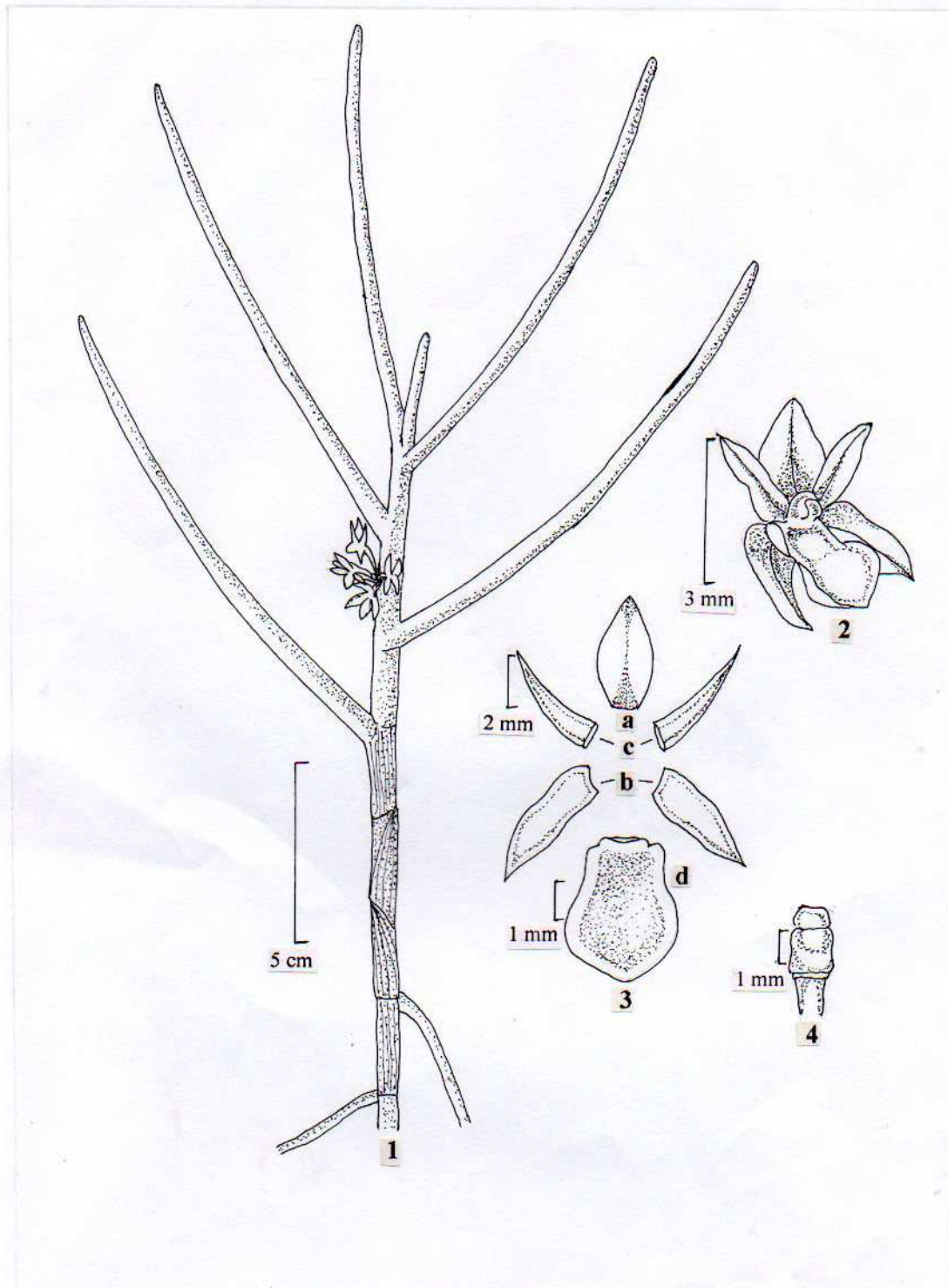


Fig. 4.32: *Luisia brachystachys* (Lindl.) Bl. 1. Habit (whole plant with flowers); 2. Angled view of flower; 3. Floral perigone, a. dorsal sepal, b. lateral sepals, c. petals, d. Lip; 4. Front view of tip of ovary, column with anther.

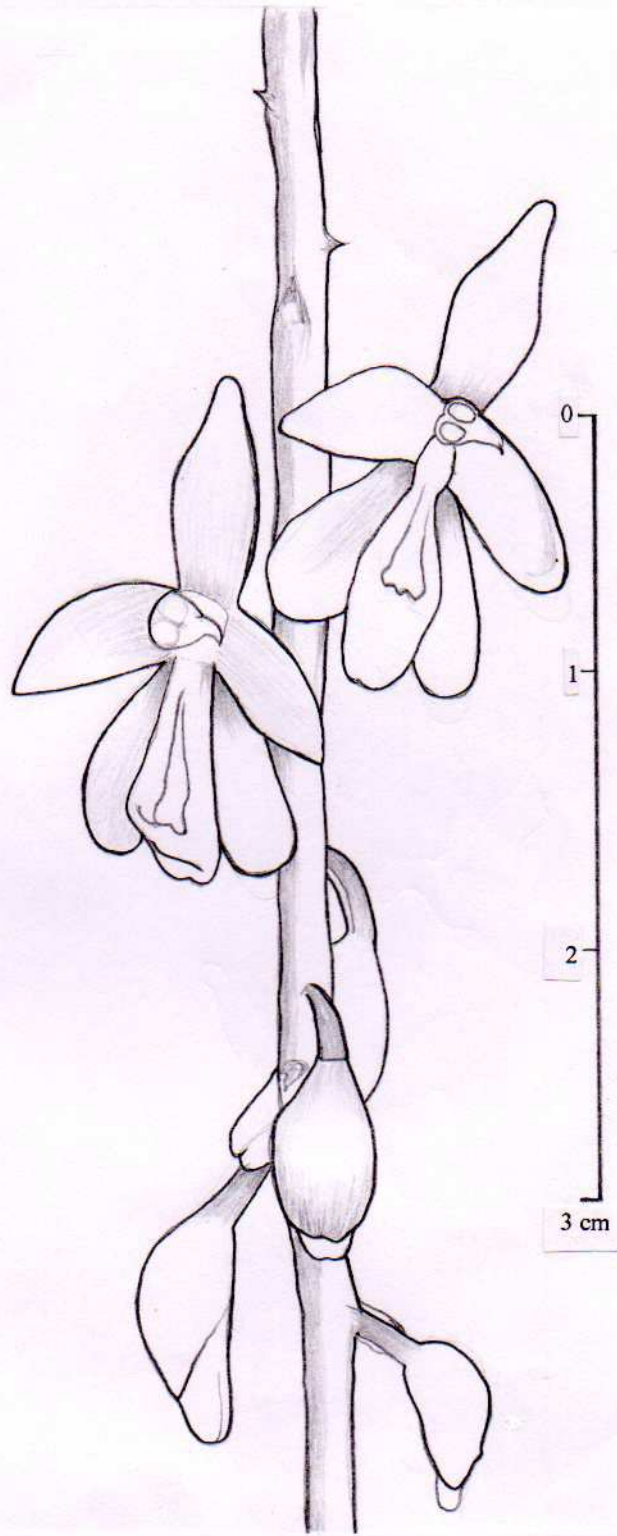


Fig. 4.33: *Micropera obtusa* (Lindl.) Tang & Wang; A portion of inflorescence.

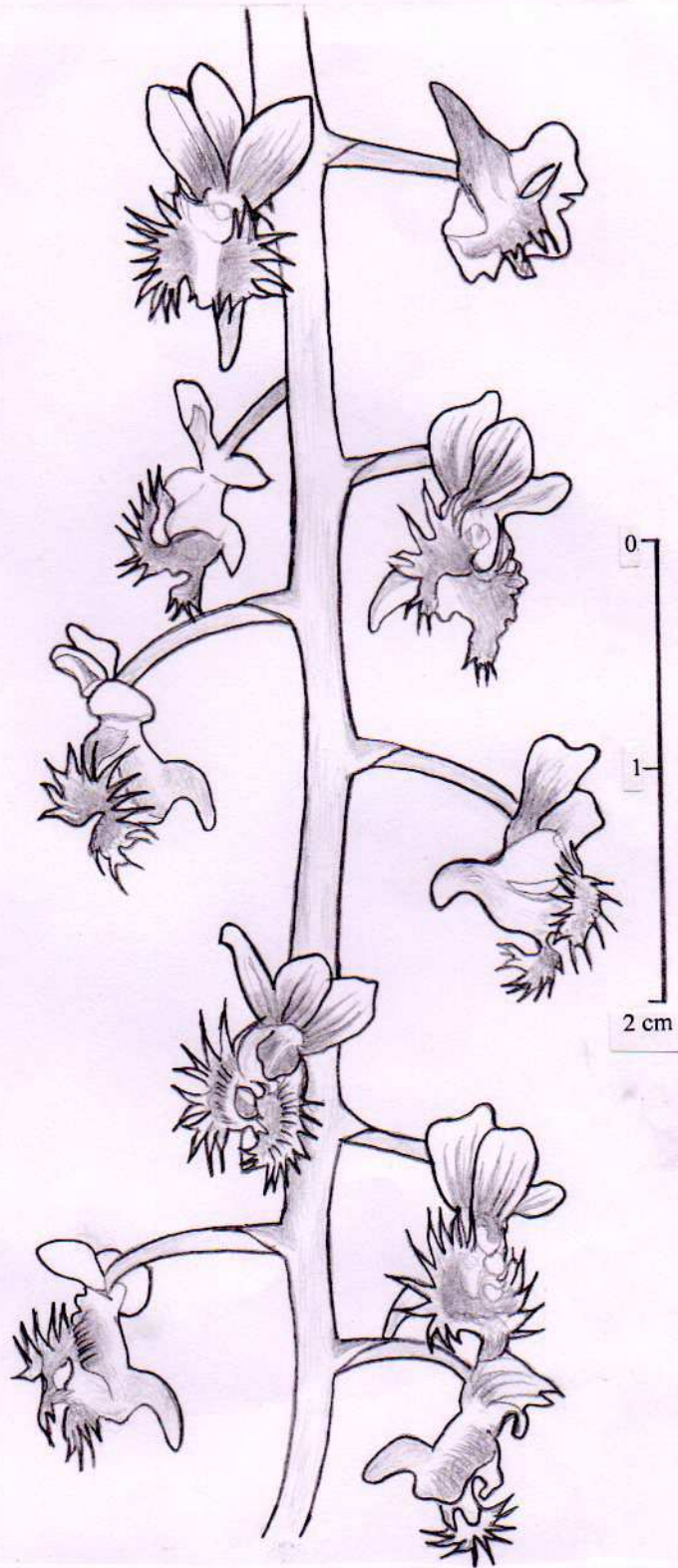


Fig. 4.34: *Ornithochilus difformis* (Wall. ex Lindl.) Schltr.; A portion of inflorescence.

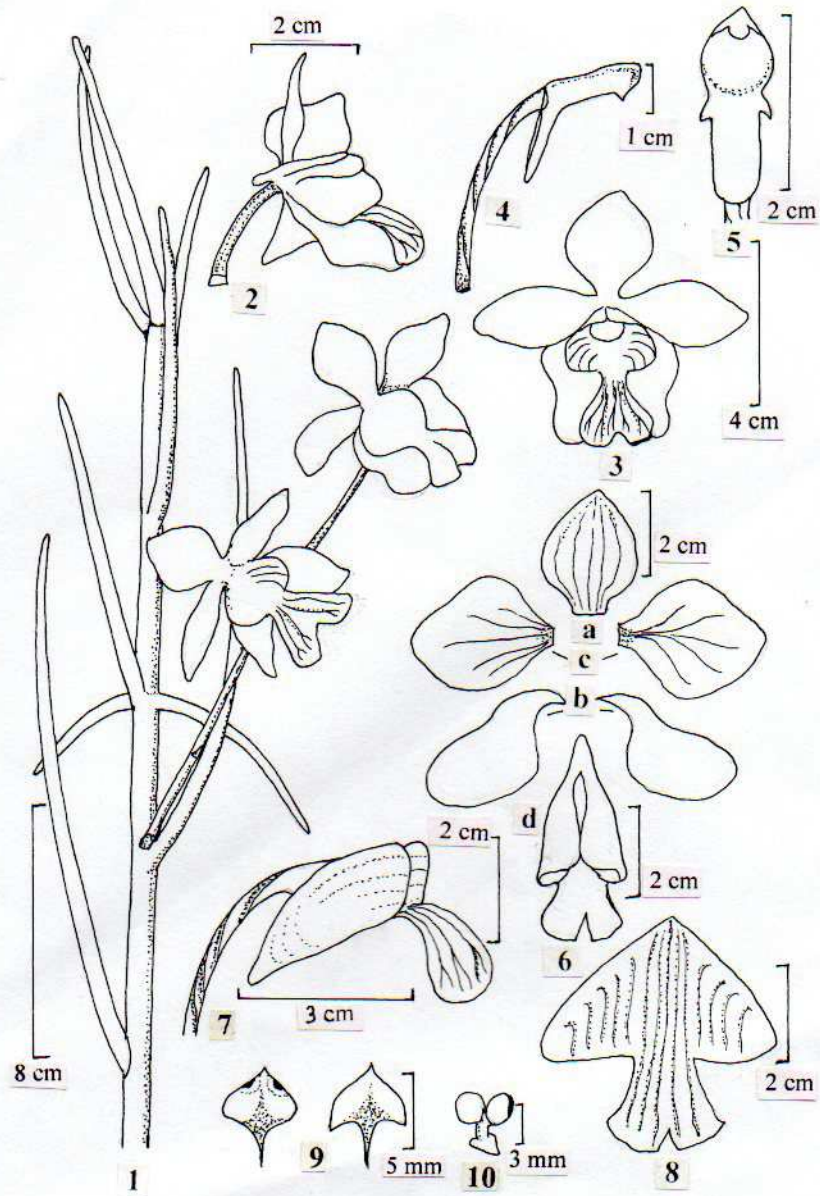


Fig. 4.35: *Papilionanthe teres* (Roxb.) Schltr. 1. Habit (stem with inflorescence); 2. Side view of flower; 3. Front view of flower; 4. Pedicellate-ovary, column with foot; 5. Front view of pedicellate ovary tip, column with anther; 6. Floral perigone, a. dorsal sepal, b. lateral sepals, c. petals, d. lip; 7. Side view of pedicellate ovary and lip; 8. Flattened view of lip; 9. Ventral and dorsal views of anther; 10. Pollinia.

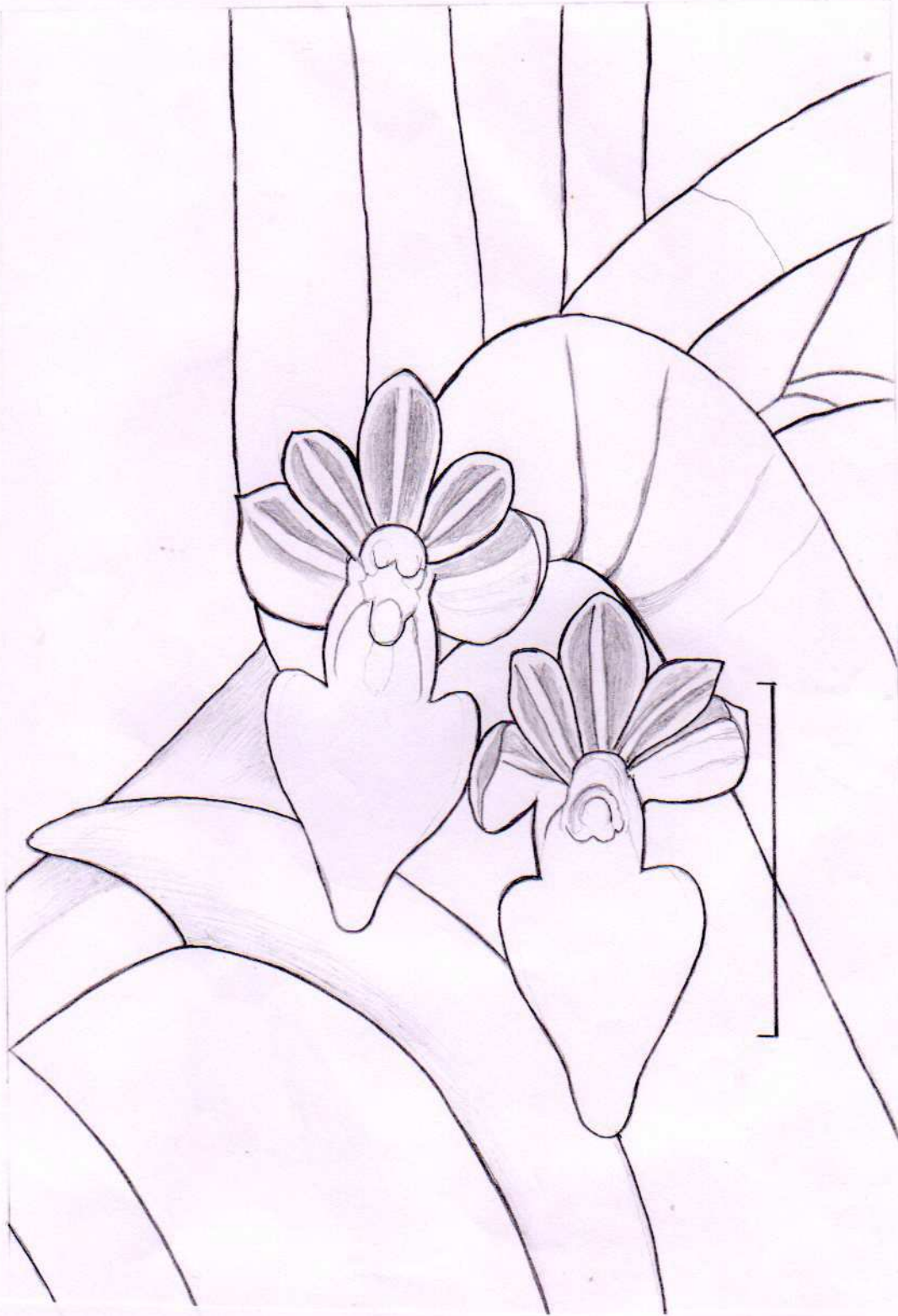


Fig. 4.36: *Pelatantheria insectifera* (Rchb. f.) Ridl.; A portion of plant with flowers.

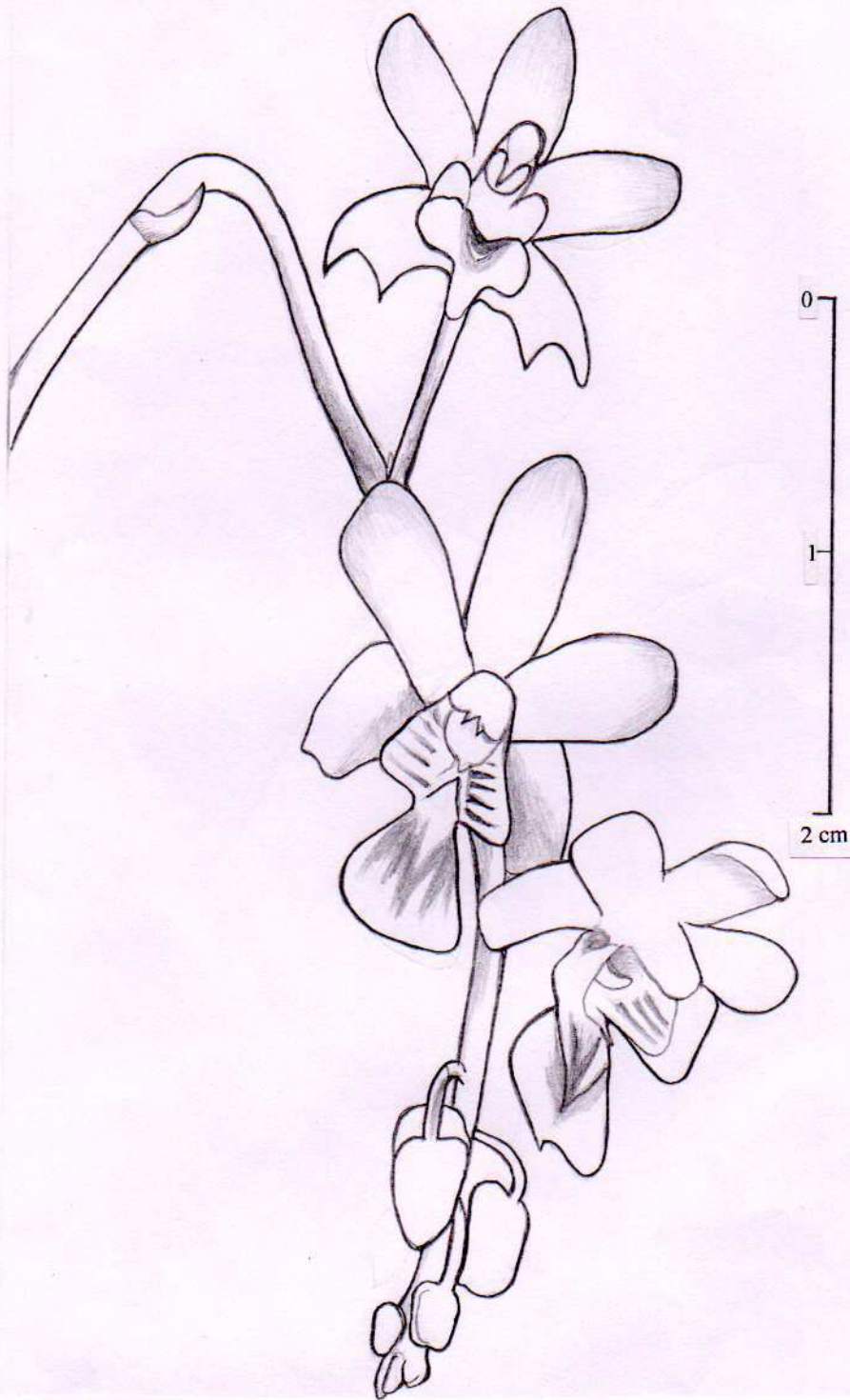


Fig. 4.37: *Phalaenopsis deliciosa* Rchb. f.; A portion of inflorescence.

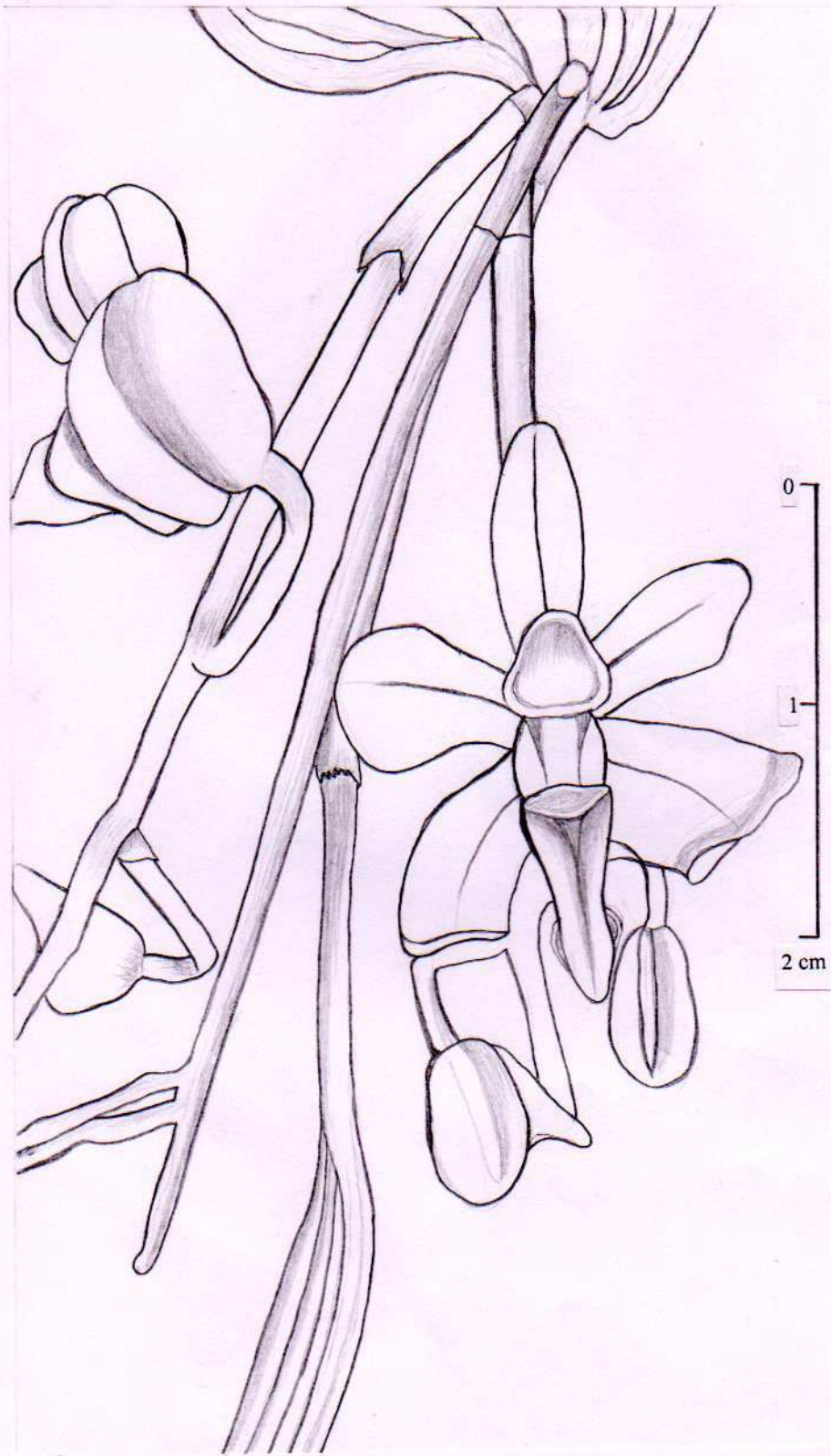


Fig. 4.38: *Phalaenopsis taenialis* (Lindl.) E.A. Christenson & Pradhan; A portion of plant with inflorescence.

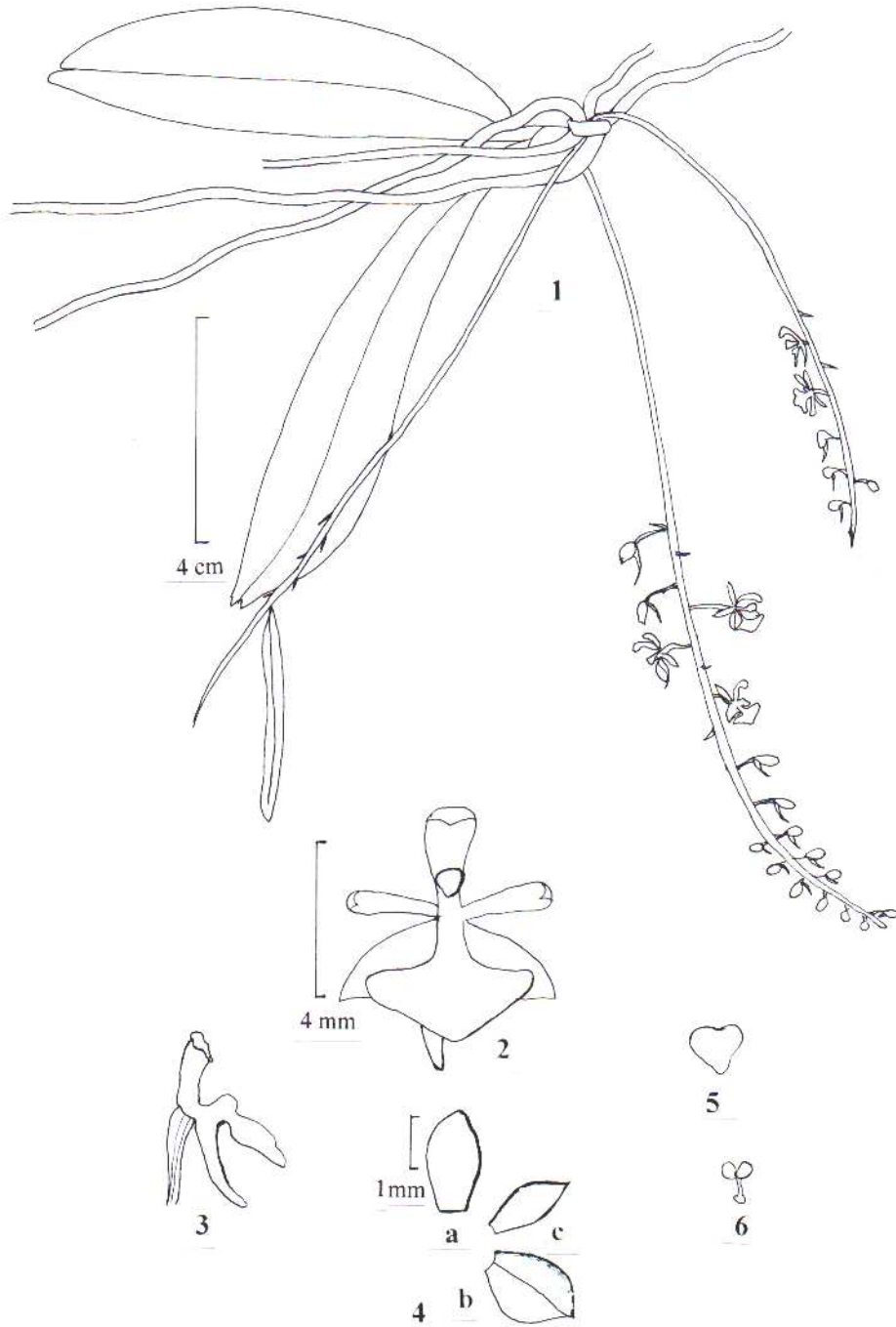


Fig. 4.39: *Saccolabiopsis pusilla* (Lindl.) Seidenf. & Garay; **1.** Habit (whole plant with inflorescences); **2.** Front view of flower; **3.** Side view of pedicellate ovary, column, spur and lip; **4. a.** dorsal sepal, **b.** lateral sepal and **c.** petal; **5.** Anther; **6.** Pollinia.

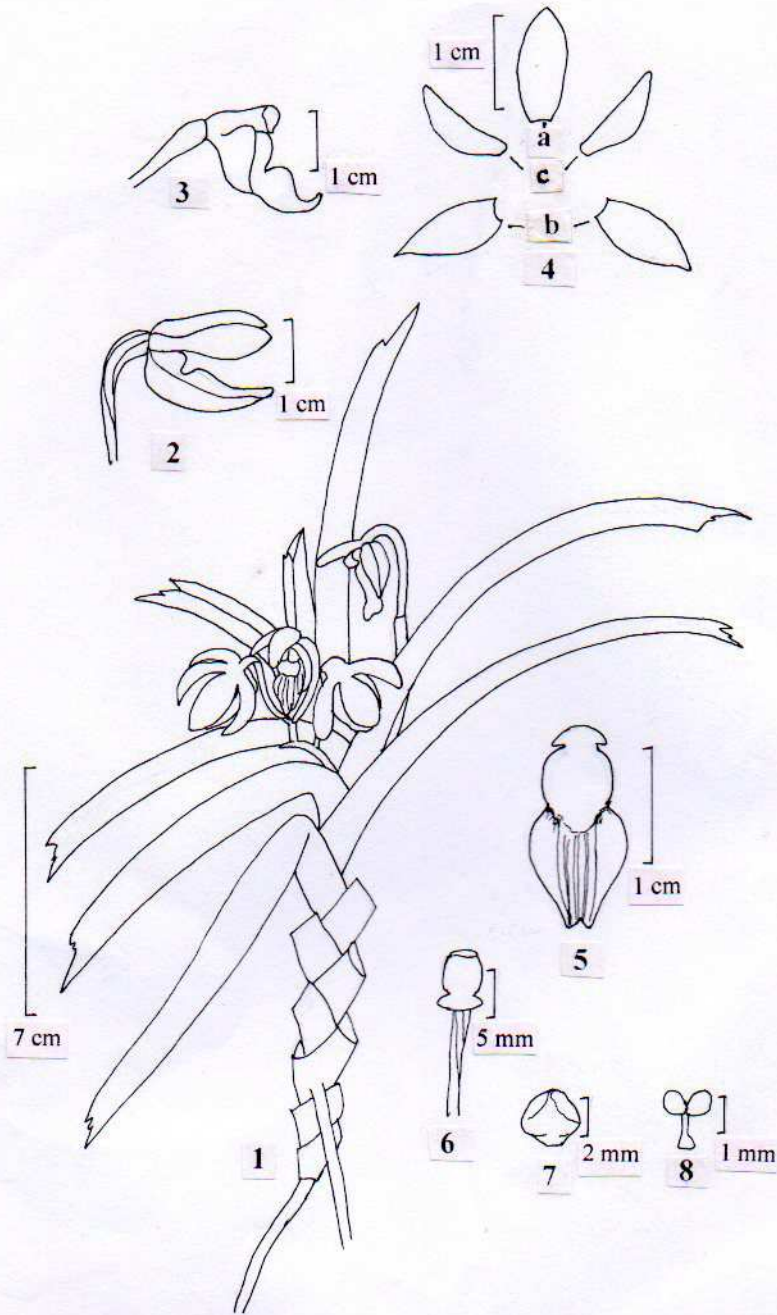


Fig. 4.40: *Vanda alpina* Lindl.; 1. Habit (whole plant with inflorescence); 2. Side view of flower with pedicellate ovary; 3. Side view of pedicellate ovary, column and lip; 4. Floral perigone, a. dorsal sepal, b. lateral sepals and c. petals; 5. Front view of lip; 6. Pedicellate ovary with column; 7. Anther; 8. Pollinia.

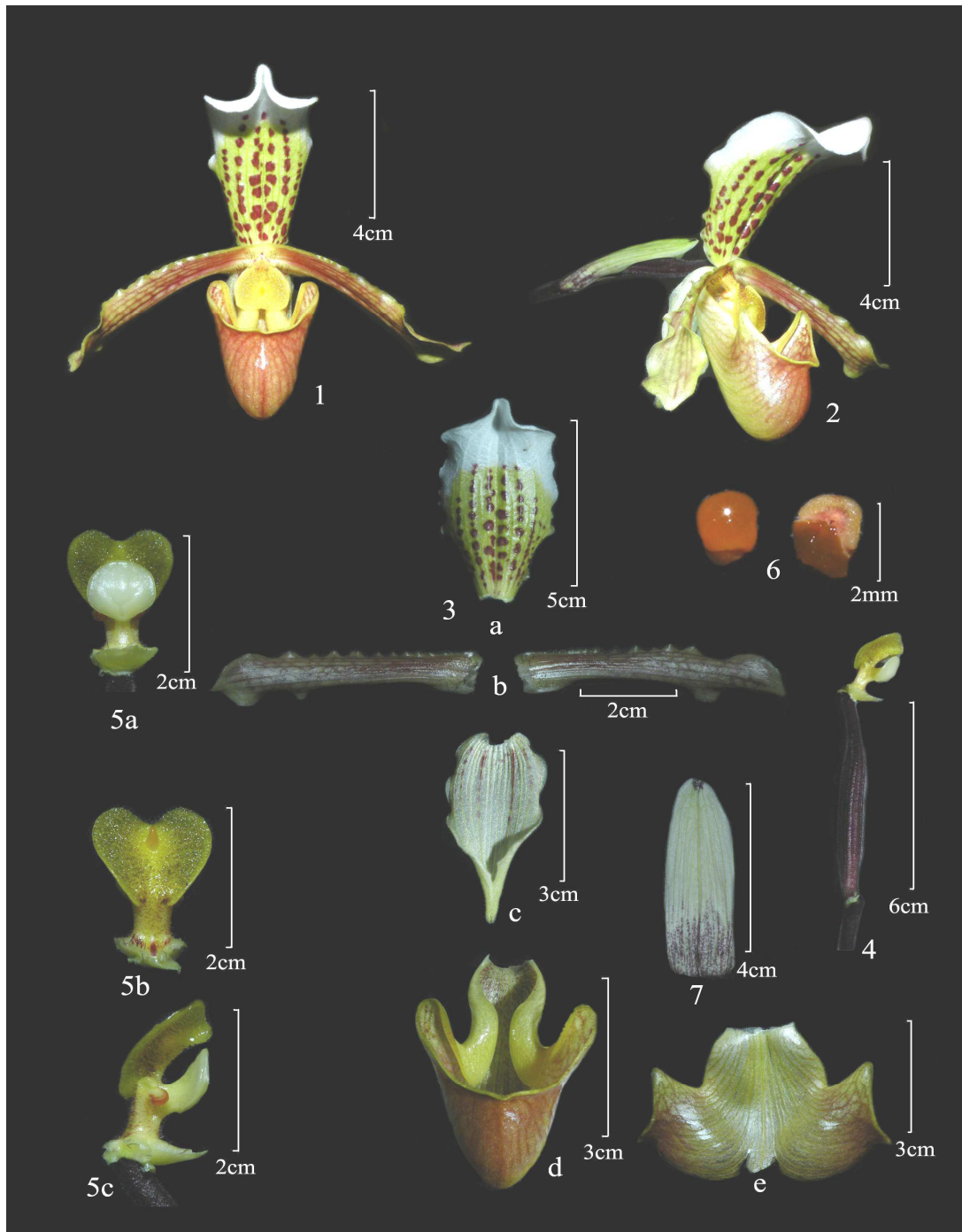


Plate 4.1: *Paphiopedilum insegue* (Wall. ex Lindl.) Pfitz. **1.** Front view of single flower; **2.** Flower side view; **3.** Floral perigone, **a.** dorsal sepal, **b.** petals, **c.** synsepal, **d.** lip, **e.** flattened view of lip; **4.** Pedicellate ovary, column and staminode; **5a.** top view of staminode, **5b.** ventral view of staminode, **5c.** Side view of staminode; **6.** Pollinia; **7.** Floral bract.



Plate 4.2: *Crepidium acuminatum* (D. Don) Szlach., Intraspecific variation on floral colour; **A.** Flowers colour blakish red and **B.** Flowers colour yellowish-green.



Plate 4.3: *Geodorum densiflorum* (Lamk.) Schltr. var. nov. *kalimpongense* Rajendra Yonzon, D. Lama, R. B. Bhujel & Samuel Rai [Young inflorescence close up view].

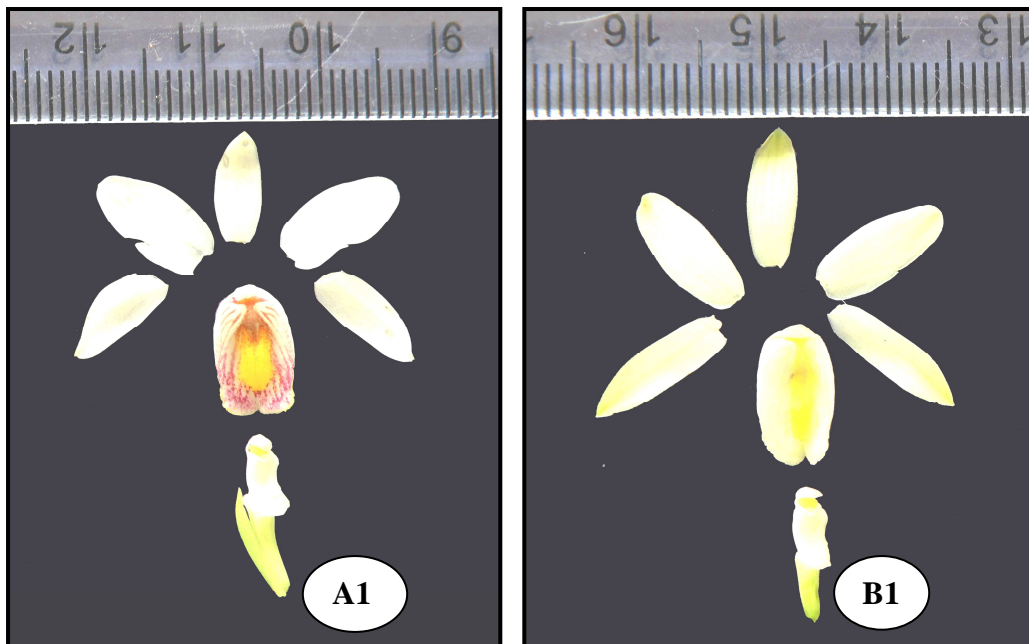
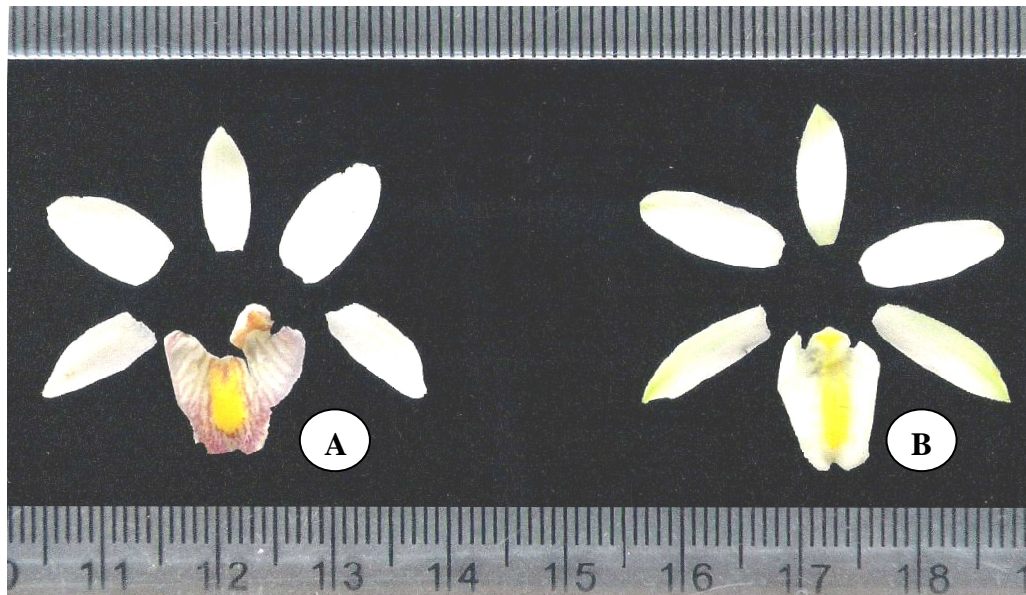


Plate 4.4: A and A1. *Geodorum densiflorum* (Lamk.) Schltr. (floral perigone, dorsal sepal, lateral sepals, petals, lip and pedicellate ovary with column).

B and B1. *G. densiflorum* (Lamk.) Schltr. var. nov. *kalimpongense* Rajendra Yonzon, D. Lama, R. B. Bhujel & Samuel Rai (floral perigone, dorsal sepal, lateral sepals, petals, lip and pedicellate ovary with column).

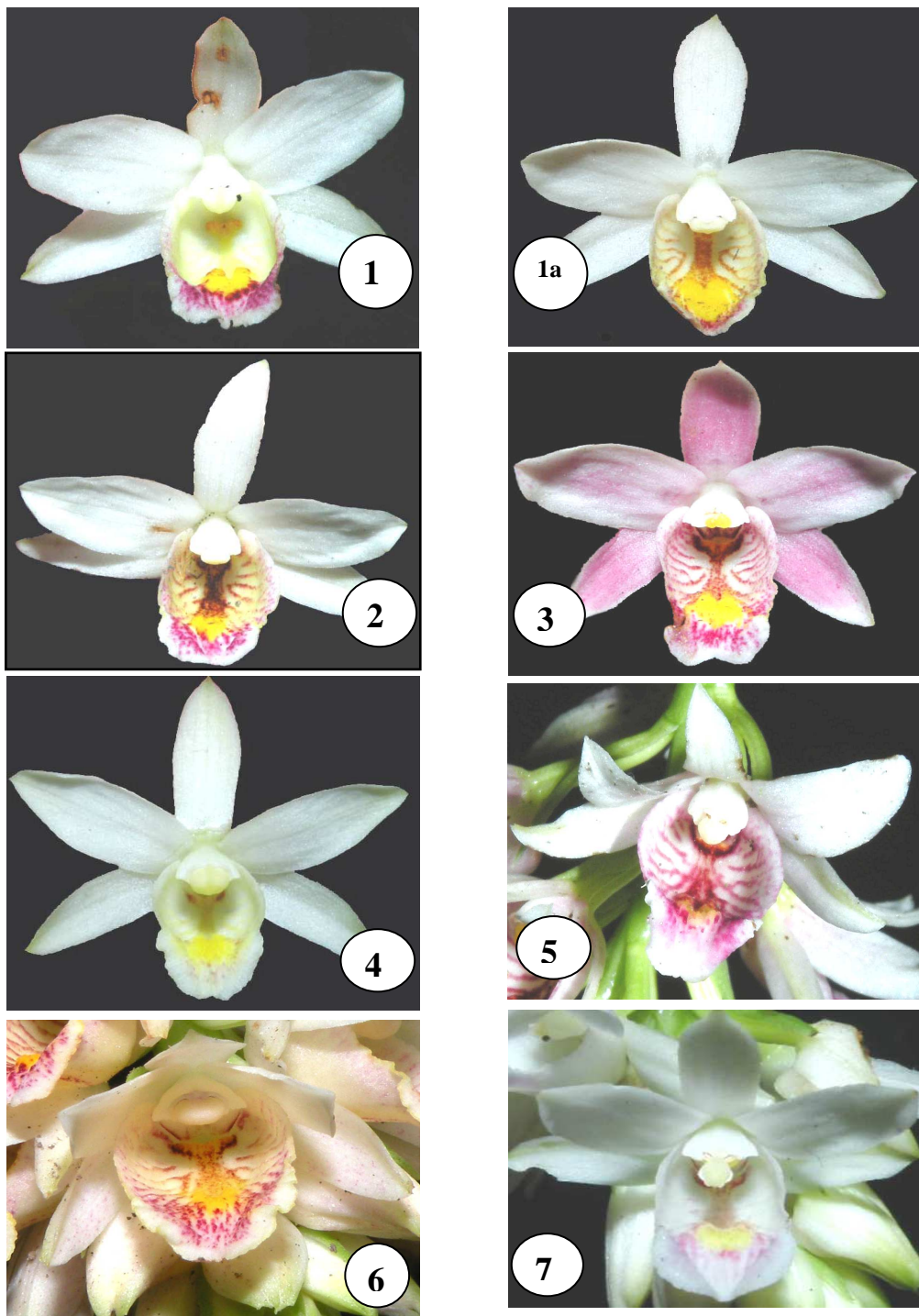


Plate 4.5: *Geodorum densiflorum* (Lamk.) Schltr. Intraspecific floral morphology and colour varied species (1-7).

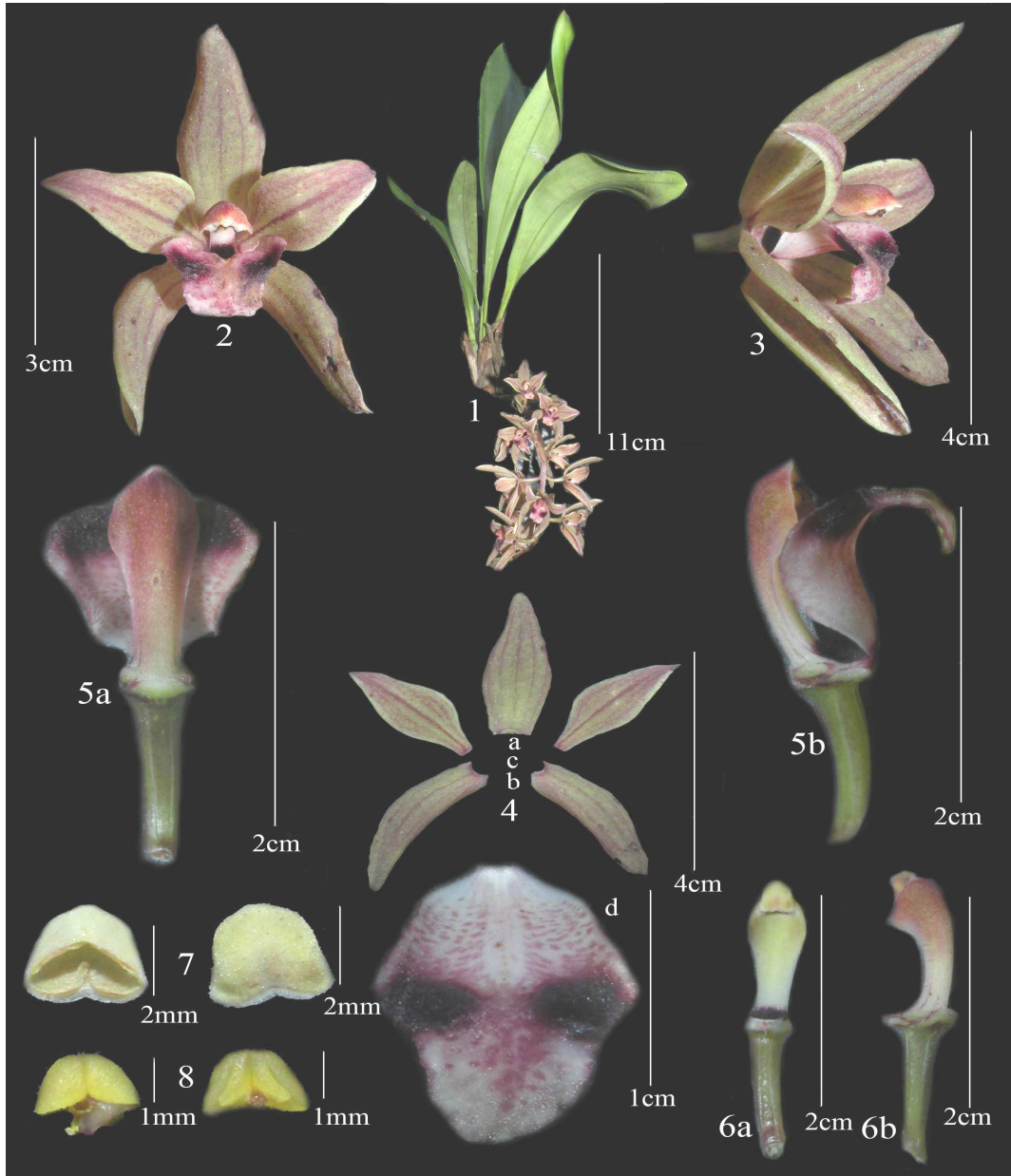


Plate 4.6: *Cymbidium devonianum* Lindl. ex Paxt., **1**. Habit (whole plant with pendent inflorescence); **2**. Front view of flower; **3**. Side view of flower; **4**. Floral perigone showing **a**. dorsal sepal, **b**. lateral sepals, **c**. petals and **d**. lip; **5a**. Top view of pedicellate ovary, column and lip; **5b**. Side view of same; **6a** and **6b**. Different view of pedicellate ovary, column with anther; **7**. Different view of anther; **8**. Pollinia.

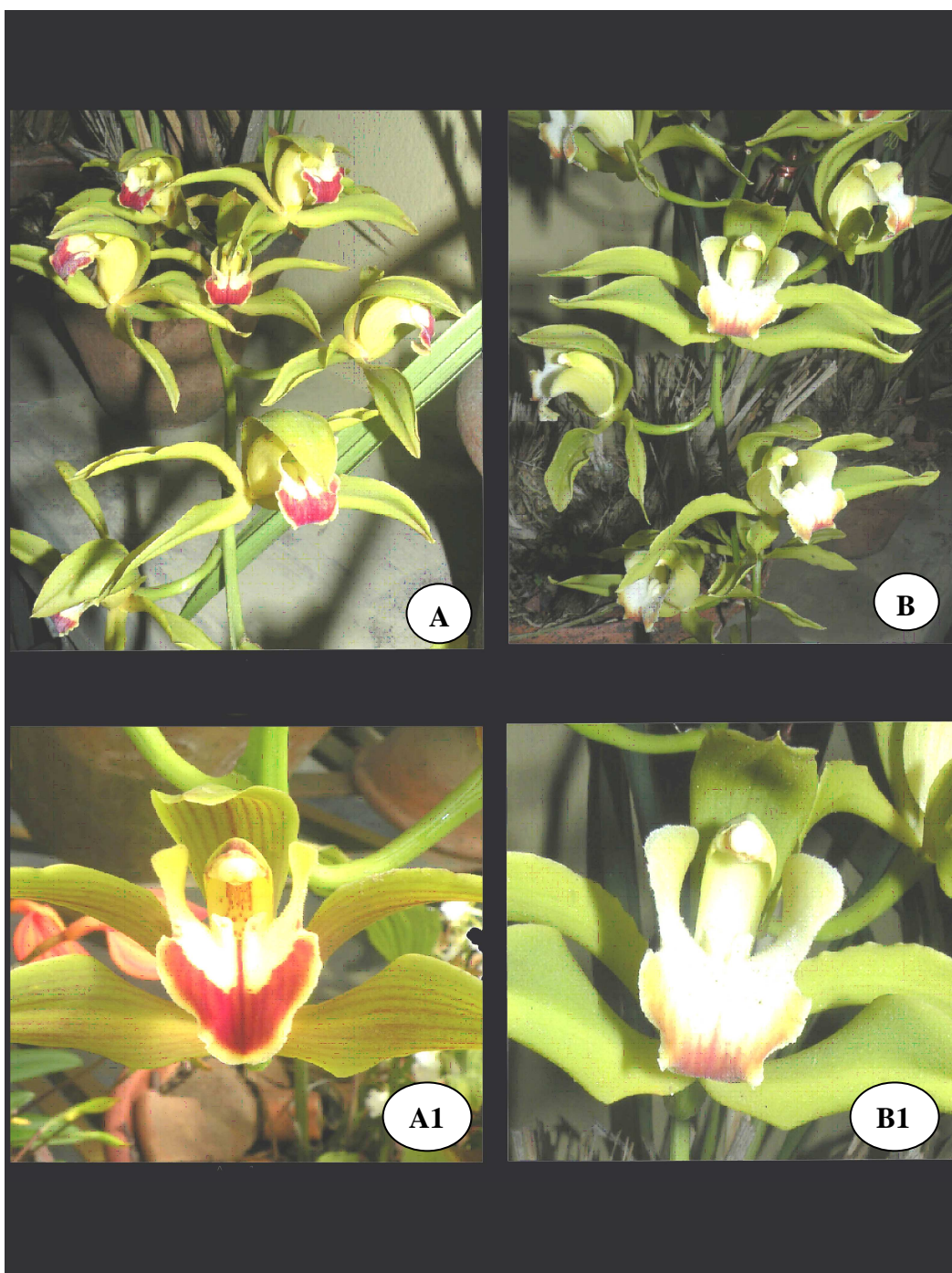


Plate 4.7: *Cymbidium lowianum* (Rchb. f.) Rchb. f., Intraspecific floral colour variation: Specimens **A** and **B**. Young inflorescence with flowers; **A1** and **B1**. Close up view of single flower showing colour variation on floral parts.

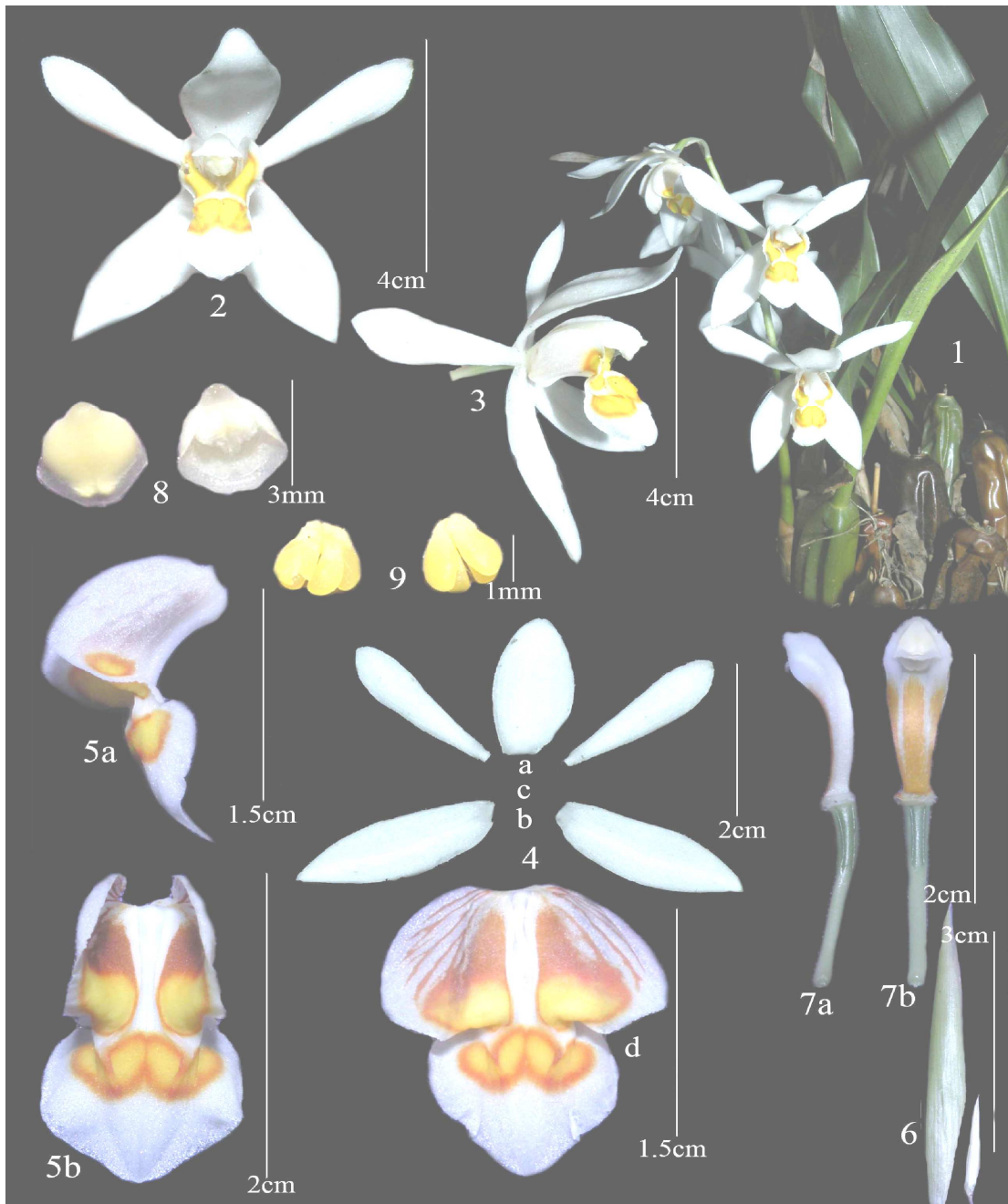


Plate 4.8: *Coelogyne corymbosa* Lindl., **1.** Habit (plant with inflorescence); **2.** Front view of flower; **3.** Side view of flower; **4.** Floral perigone showing **a.** dorsal sepal, **b.** lateral sepals, **c.** petals and **d.** lip; **5a** and **5b.** different view of lip; **6.** Floral bracts; **7a** and **7b.** different view of pedicellate ovary, column with anther; **8.** Different view of anther; **9.** Pollinia.

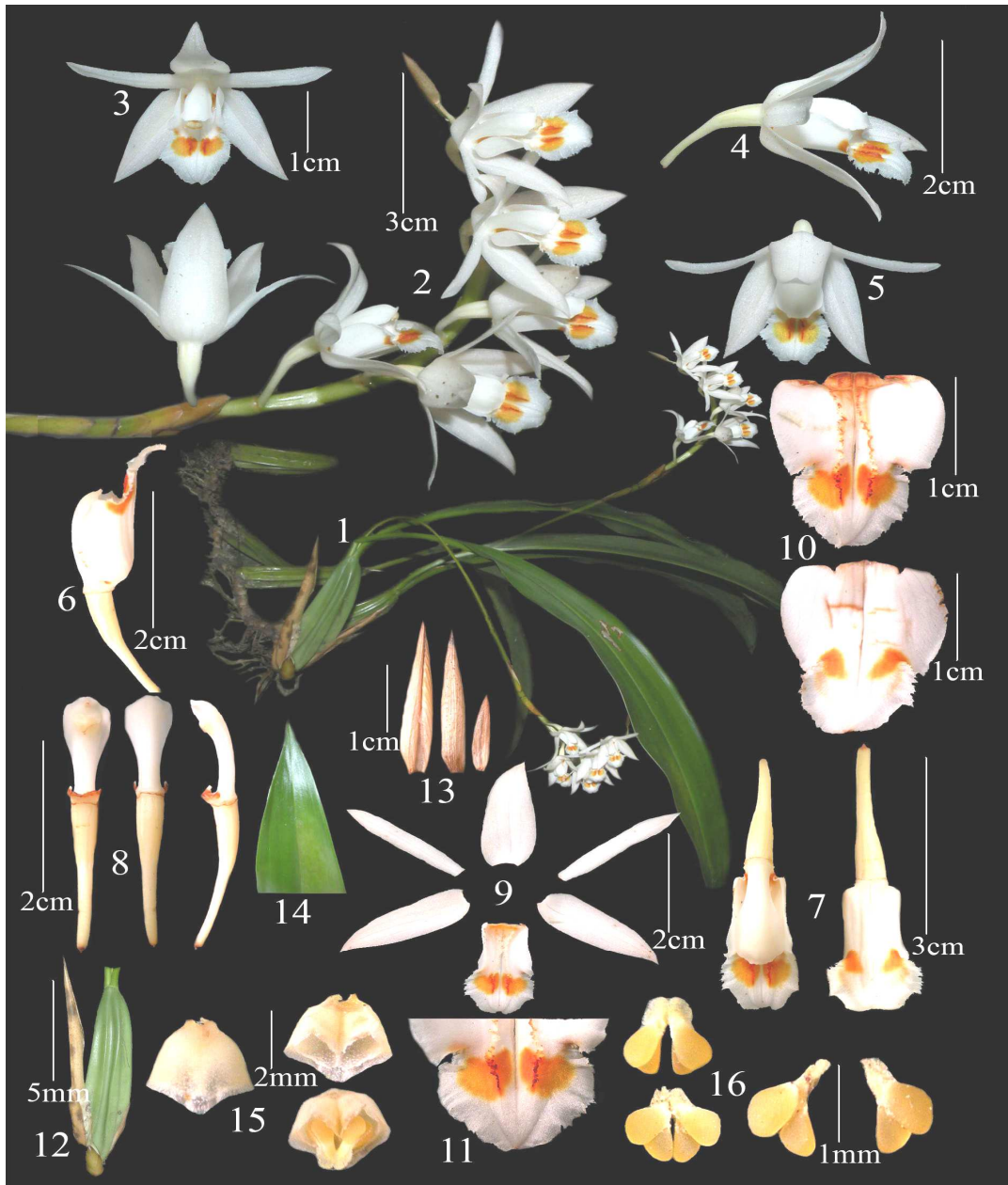


Plate 4.9: *Coelogyne stricta* (D. Don) Schltr., **1.** Habit (whole plant with young inflorescence); **2.** Close up view of rachis; **3.** Front view of flower; **4.** Side view of flower; **5.** Top view of flower; **6.** Side view of pedicellate ovary, lip and column; **7.** Different view of same; **8.** Different view of pedicellate ovary with column; **9.** Floral perigone showing dorsal sepal, lateral sepals, petals and lip; **10.** Different view of flattened lip; **11.** Front view of lip epichile; **12.** Pseudobulb with sheath; **13.** Floral bracts; **14.** Leaf tip; **15.** Different view of anther; **16.** Different views of pollinia.

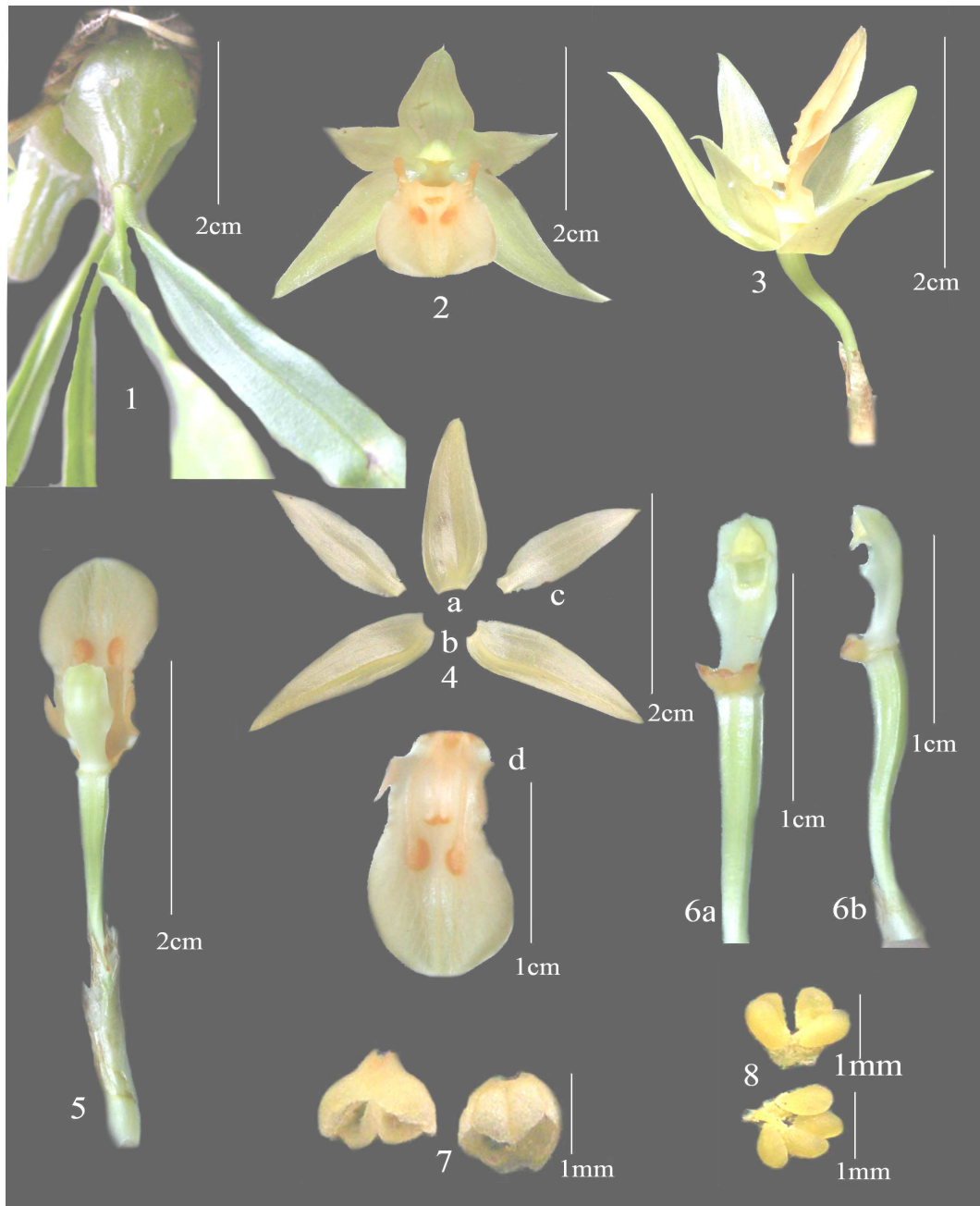


Plate 4.10: *Panisea uniflora* (Lindl.) Lindl., **1.** Habit (pseudobulb with portion of leaves); **2.** Front view of flower; **3.** Angled view of flower with pedicellate ovary with floral bract; **4.** Floral perigone showing **a.** dorsal sepal, **b.** lateral sepals, **c.** petals and **d.** lip. **5.** Pedicellate ovary with floral bract, column and lip; **6a** and **6b.** Different view of pedicellate ovary with column; **7.** Different view of anther; **8.** Pollinia.

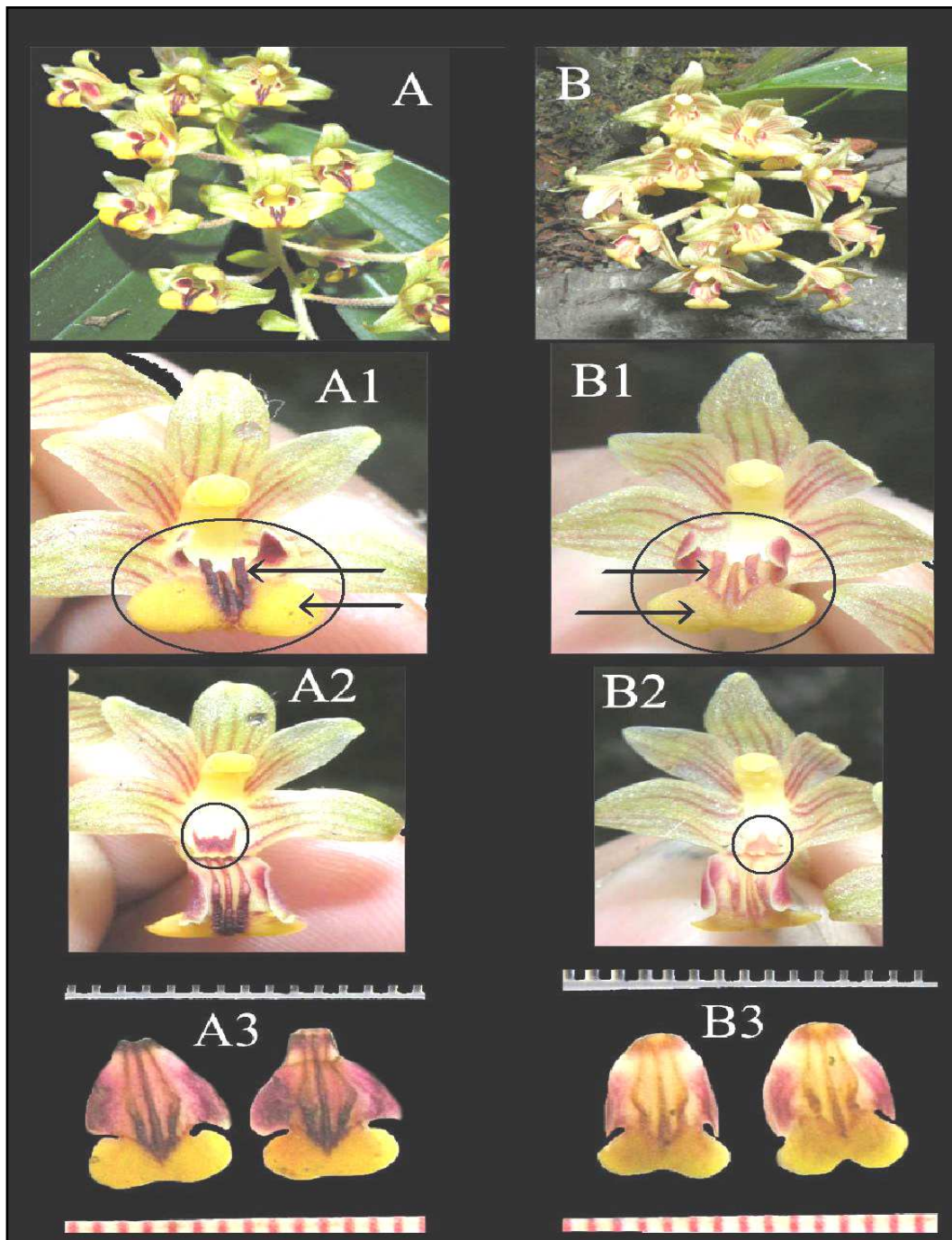


Plate 4.11: *Pinalia amica* Rchb. f., Intraspecific variation on floral morphology: Specimens **A** and **B**. Flowers in habitat; **A1** and **B1**. Front view of flower showing colour of lamellae and epichile on lip; **A2** and **B2**. Colour blotch variation showing at the base of column; **A3** and **B3**. Enlarge view of lip.

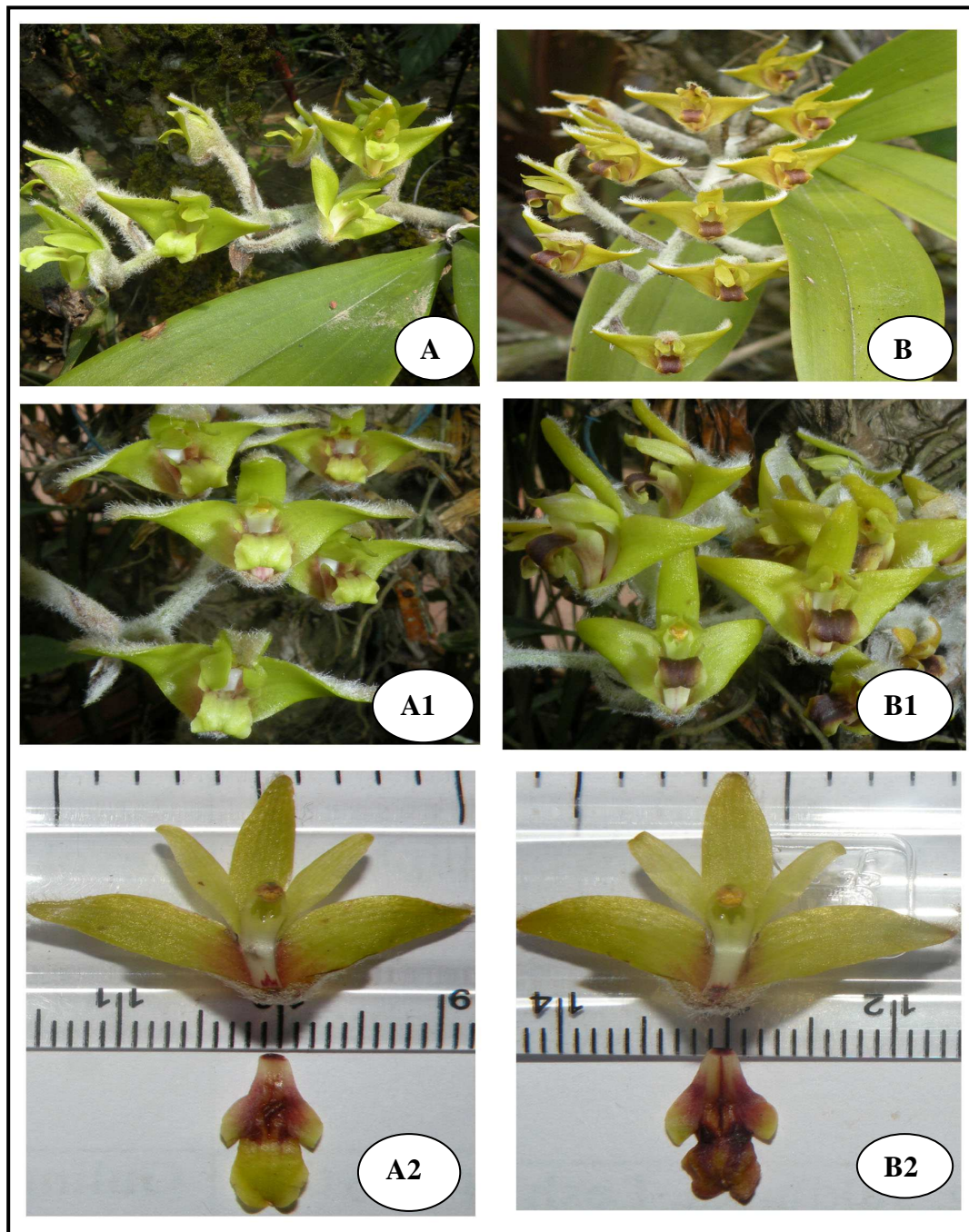


Plate 4.12: *Eria lasiopetala* (Willd.) Ormerod, Intraspecific floral lip colour variation on flowers: Specimens **A** and **B**. Plant with inflorescence in habitat; **A1** and **B1**. Close up view of flowers showing colour variation on lip (in intact form); **A2** and **B2**. Detached floral parts showing distinct colour variation on lip epichile.



Plate 4.13: *Dendrobium anceps* Sw., Intraspecific variation on flowers: Specimens **A**. Flower in habitat with pinkish grey colour and **B**. Flowers in habitat with light green colour; **A1** and **B1**. Ventral view of both colour varied flowers; **A2** and **B2**. Ventral views of flowers with detached lip; **A3** and **B3**. Same views with dorsal view of detached lip.

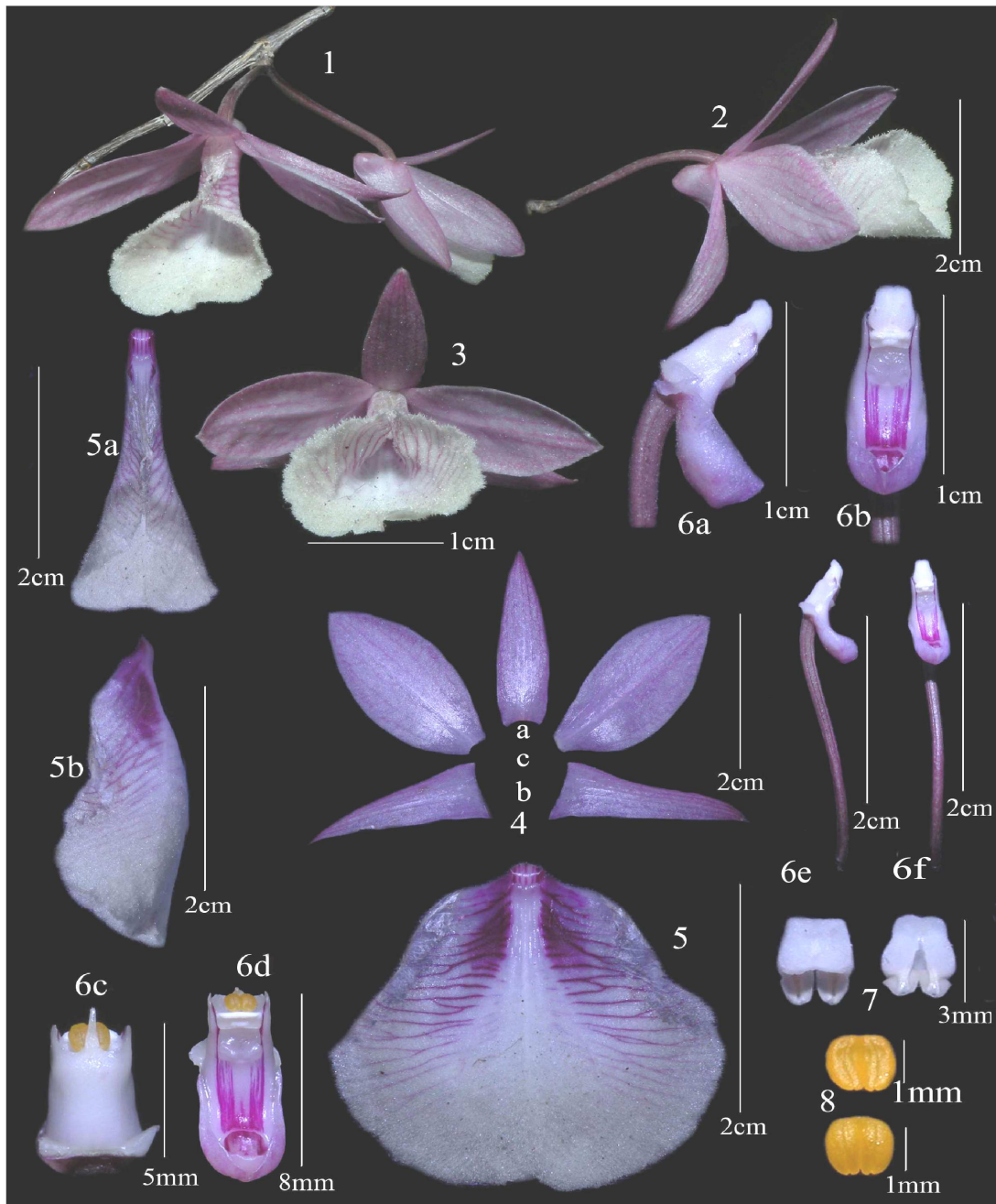


Plate 4.14. *Dendrobium aphyllum* (Roxb.) C.E.C. Fischer, **1.** Habit (portion of inflorescence); **2.** Side view of flower; **3.** Front view of flower; **4.** Floral perigone showing **a.** dorsal sepal, **b.** lateral sepals and **c.** petals; **5a** and **5b.** Different view of lip; Lip; **6a.** **6b.** **6c** and **6d.** Different view of column with foot, anther and pollinia; **6e** and **6f.** Different views of pedicellate ovary, column foot with anther; **7.** Different view of anther; **8.** Pollinia.

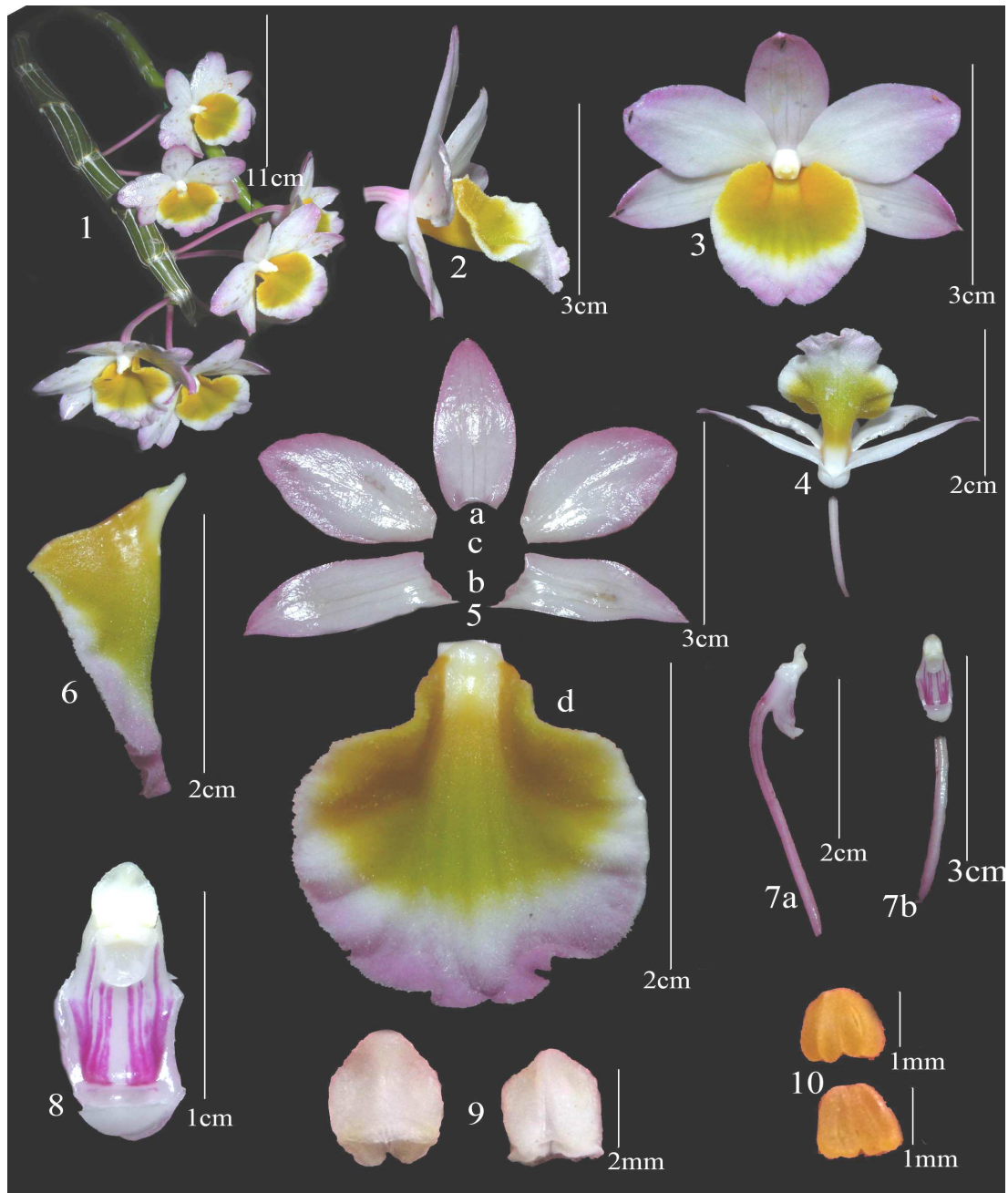


Plate 4.15: *Dendrobium crepidatum* Lindl. & Paxt., **1.** Habit (portion of plant with flowers); **2.** Side view of flower; **3.** Front view of flower; **4.** Dorsal view of flower; **5.** Floral perigone showing **a.** dorsal sepal, **b.** lateral sepals, **c.** petals and **d.** lip; **6.** Side view of lip; **7a** and **7b.** Different view of pedicellate ovary, column with anther; **8.** Front view of column with anther; **9.** Different view of anther; **10.** Pollinia.

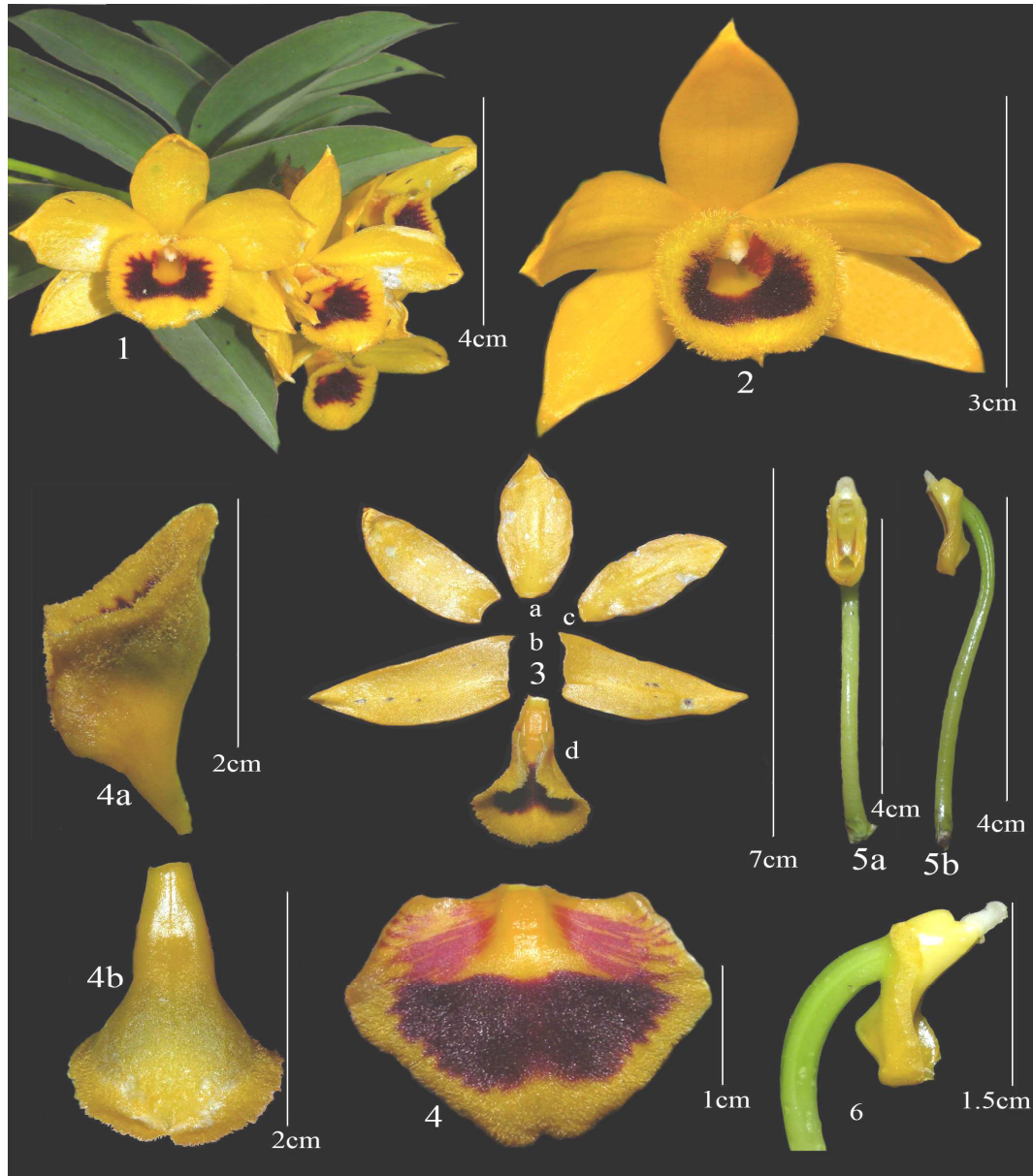


Plate 4.16: *Dendrobium ochreatum* Lindl., **1.** Habit (plant with inflorescence); **2.** Front view of flower; **3.** Floral perigone showing **a.** dorsal sepal, **b.** lateral sepals, **c.** petals and **d.** lip; **4.** **4a** and **4b.** Different view of lip; **5a** and **5b.** Different view of pedicellate ovary, column with anther; **6.** Close up view of pedicellate ovary, column with anther.

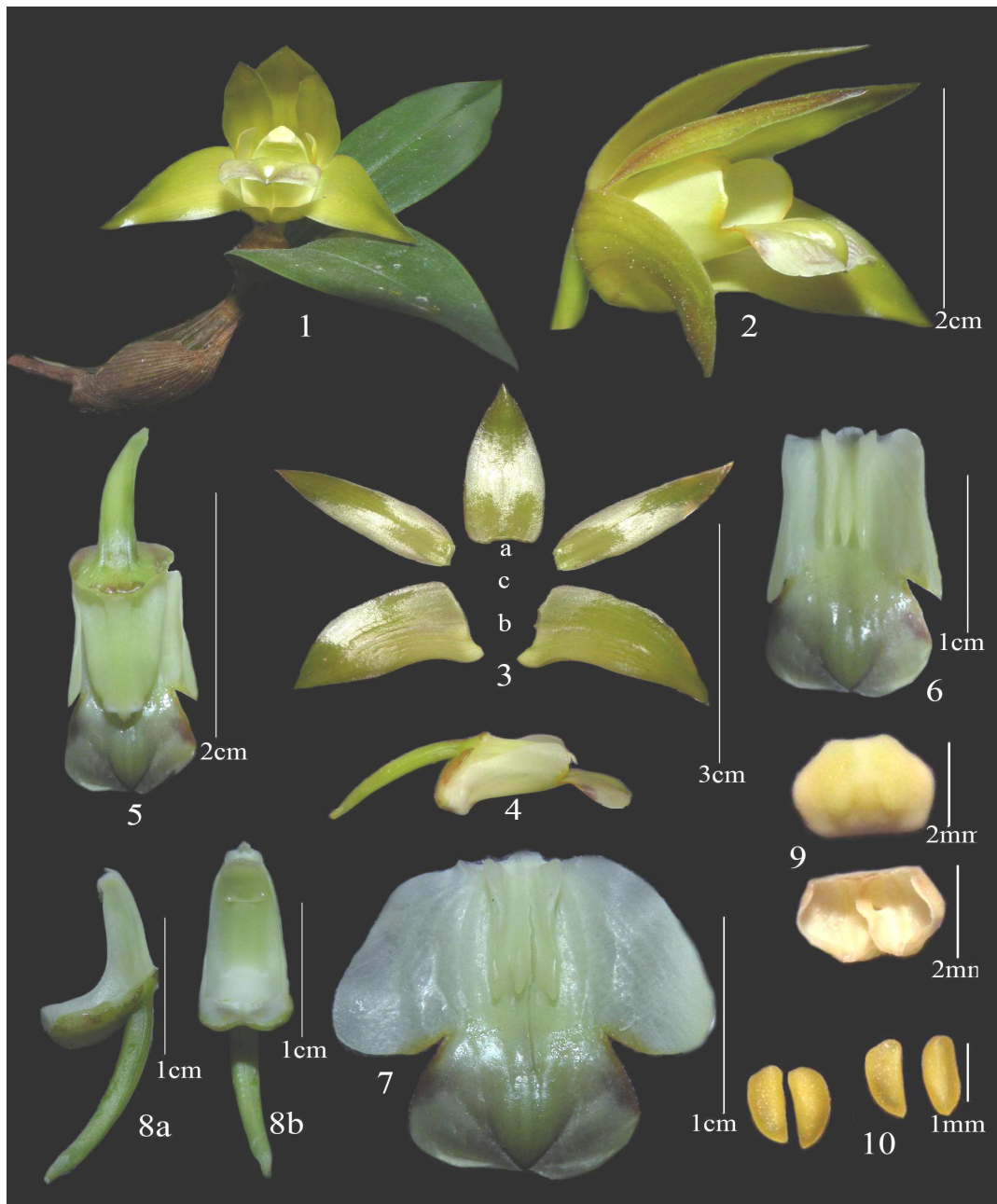


Plate 4.17: *Epigeneium rotundatum* (Lindl.) Summerh., 1. Habit (whole plant with flower; **2.** Angled view of flower; **3.** Floral perigone showing dorsal sepal, lateral sepals, petals, **4.** Side view of pedicellate ovary, column with lip; **5.** Top view of pedicellate ovary, column and lip; **6.** Front view of lip; **7.** Enlarge flattened view of lip; **8a** and **8b.** Different view of pedicellate ovary, column with anther; **9.** Different view of anther; **10.** Pollinia.



Plate 4.18: *Chiloschista parishii* Seidenf., Intraspecific variation on flower colour: Specimens **A** and **B**. Flowers in habitat; **A1** and **B1**. Close up view of flowers showing colour variation on lip; **A1** flower with lip without colour blotch and **B1** flower with lip showing reddish colour blotch on the lip.

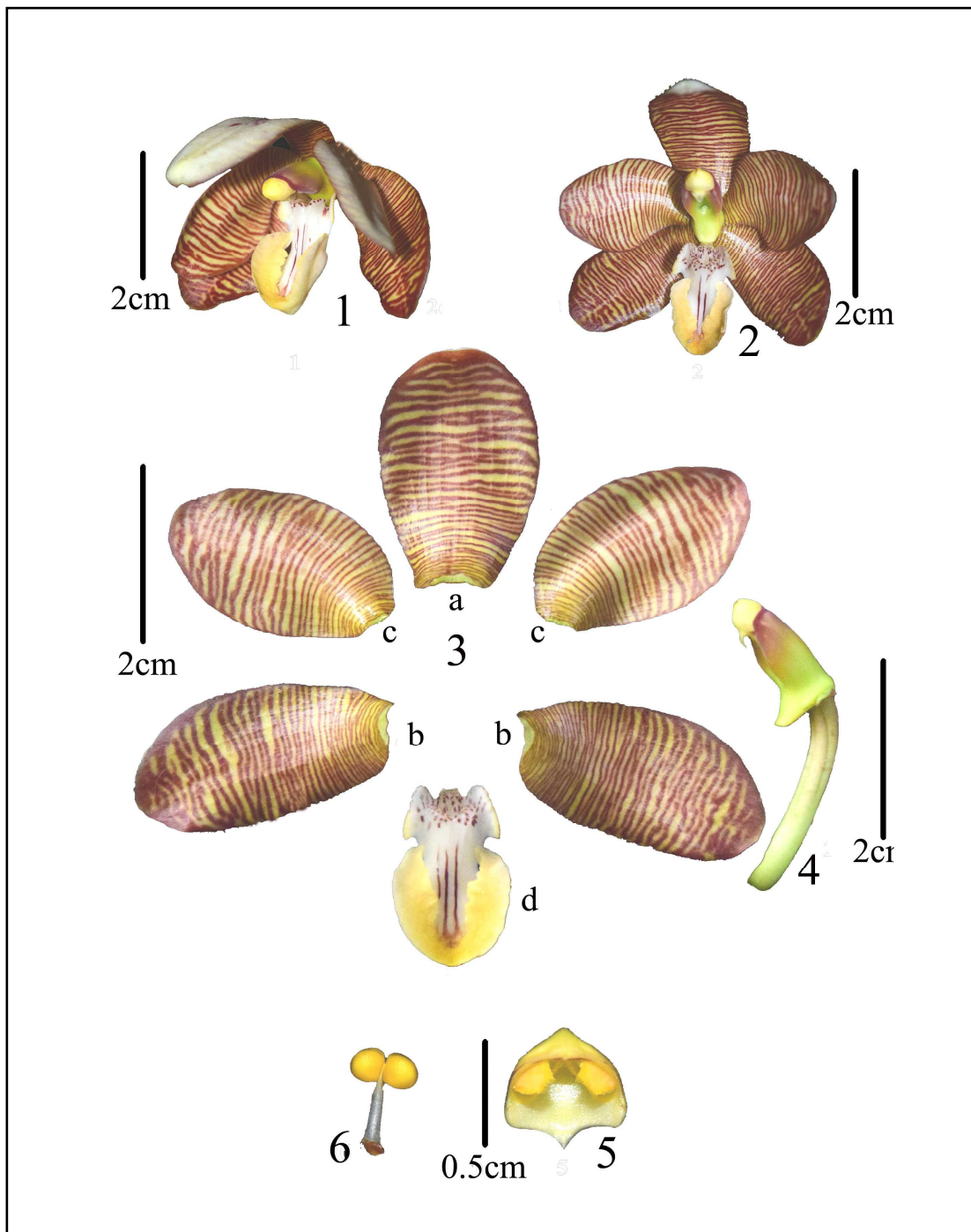


Plate 4.19: *Esmeralda cathcartii* (Lindl.) Rchb. f. **1.** Flower angled view; **2.** Flower front view; **3.** Floral perigone, **a.** dorsal sepal, **b.** petals, **c.** lateral sepals and **d.** lip; **4.** Pedicellate ovary with column and anther in situ; **5.** Ventral view of anther; **6.** Pollinia.

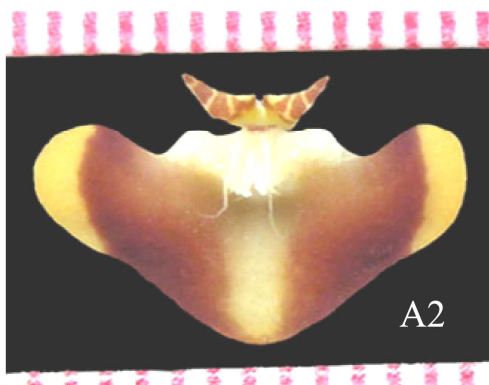
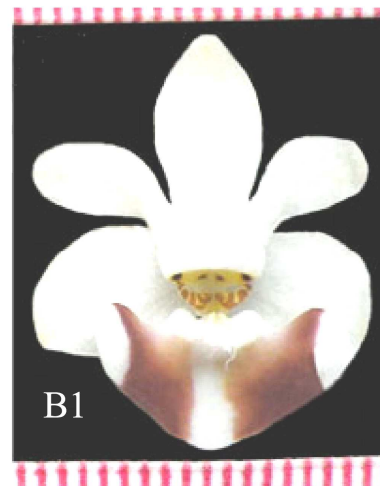
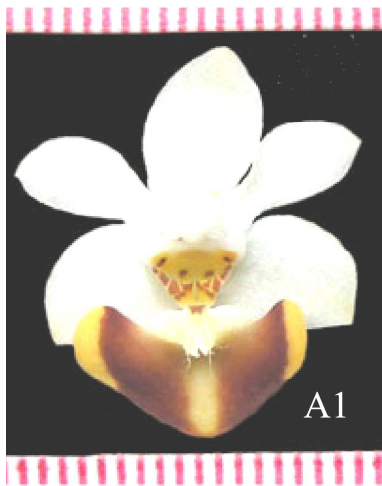


Plate 4.20: *Phalaenopsis lobbii* (Rchb. f.) H.R. Sweet, Intraspecific floral colour variation: Specimens **A** and **B**. Flowers in intact plants; **A1** and **B1**. Individual flower; **A2** and **B2**. Enlarge view of lip showing colour variation on side lobes.



Plate 4.21: *Vanda cristata* Lindl., Intraspecific variation on floral morphology: Specimens **A** and **B**. Different flowers in habitat; **A1** and **B1**. Floral perigone of two flowers with dorsal sepal, lateral sepals, petals, lip, pedicellate ovary, column with anther; **A2** and **B2**. Enlarge view of lip.



Plate 4.22: A. *Goodyera hispida* Lindl.; B. *Peristylus goodyeroides* (D. Don) Lindl.; C. *Satyrium nepalense* D. Don, var. *ciliatum* (Lindl.) Hook. f. and D. *Tainia megalantha* Tang & Wang.



Plate 4.23: A. *Calanthe sylvatica* (Thou.) Lindl.; B. *Phaius flavus* (Bl.) Lindl.;
C. *Anthogonium gracile* Lindl. and D. *Tainia minor* Hook. f.



Plate 4.24: A. *Coelogyne barbata* Lindl. ex Griff.; B. *Pholidota rubra* Lindl.; C. *Pleione hookeriana* (Lindl.) B.S. Williams and D. *Cryptochilus sanguinea* Wall.

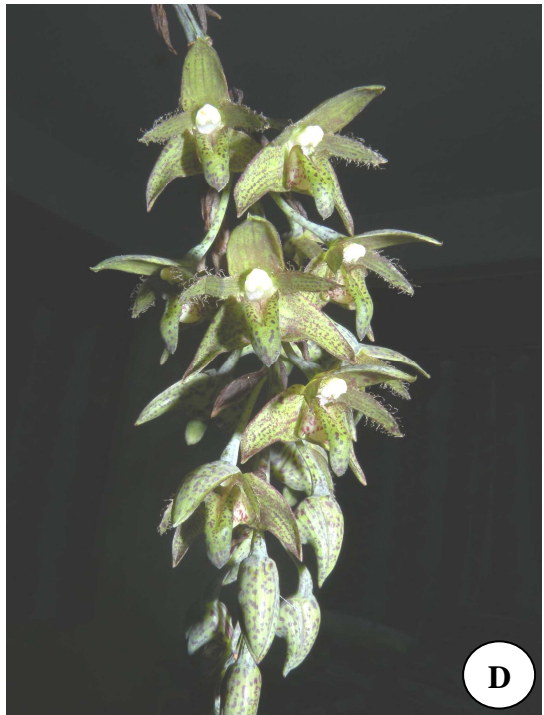


Plate 4.25: A. *Eria biflora* Griff.; B. *Trichotosea dasyphylla* (Par. & Rchb. f.) Kranz.; C. *Dendrobium porphyrochilum* Lindl. and D. *Achrochaene punctata* Lindl.



Plate 4.26: **A.** *Bulbophyllum guttulatum* (Hook. f.) N.P. Balak.; **B.** *Sunipia cirrhata* (Lindl.) P.F. Hunt; **C.** *Acampe carinata* (Griff.) Panigrahi and **D.** *Ascocentrum ampullaceum* (Roxb.) Schltr.



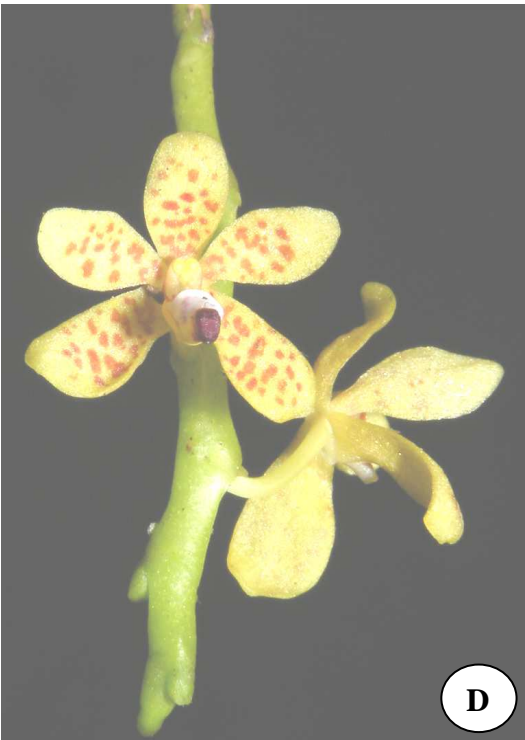
A



B



C



D

Plate 4.27: A. *Cleisocentron pallens* (Cathcart *ex* Lindl.) Pearce & Cribb; B. *Cleisostoma racemiferum* (Lindl.) Garay; C. *Luisia filiforme* Hook. f. and D. *Pteroceras teres* (Bl.) Holtt.

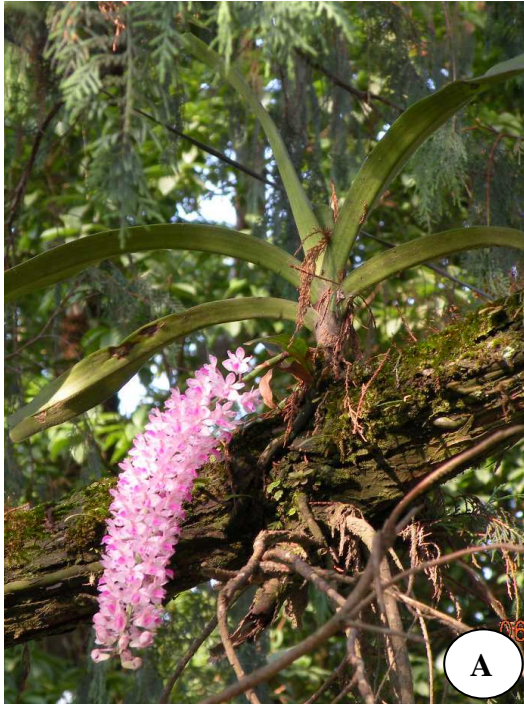


Plate 4.28: A. *Rhynchosstylis retusa* (L.) Bl.; B. *Smitinandia micrantha* (Lindl.) Holttum; C. *Uncifera obtusifolia* Lindl. and D. *Vandopsis undulata* (Lindl.) J.J. Sm.