

DIVERSITY OF Orchids

In Prakriti-Kunj -
The Nature Learning Centre



G.B. Pant National Institute of Himalayan Environment
Sikkim Regional Centre, Gangtok, Sikkim

Supported by :
National Mission on Himalayan Studies
Ministry of Environment, Forest & Climate Change
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Forest & Environment Department
Govt. of Sikkim



Diversity of Orchids in *Prakriti-Kunj* – The Nature Learning Centre

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PHOTO CREDITS

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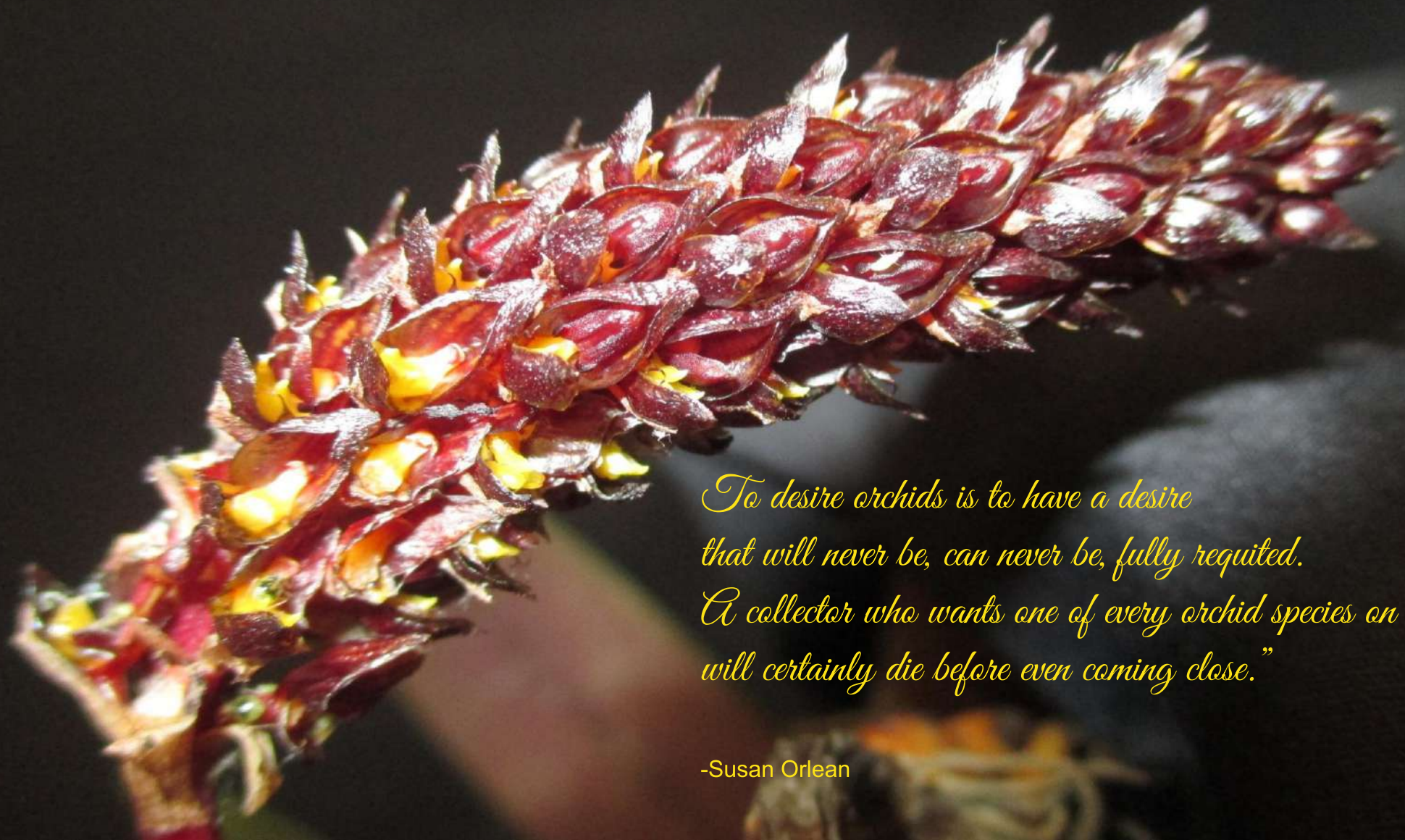


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*To desire orchids is to have a desire
that will never be, can never be, fully requited.
A collector who wants one of every orchid species on earth
will certainly die before even coming close.”*

-Susan Orlean



Message



Sikkim, the smallest Himalayan state in India with an area of 7096 sq. km., encompasses diverse climatic and geographic diversity which consequently gives rise to rich support system for floristic diversity. Sikkim located in the adobe of biodiversity hotspot in Eastern Himalaya is very rich in floristic biodiversity with more than 5000 taxa of flowering plants, 362 taxa of fern and fern allies, and many other components of biodiversity. Among the flowering plants, Sikkim alone houses 560 orchid species out of 1300 in the country. The tremendous diversity of plants as well as a host of other life forms is yet to be explored. However, the lack of awareness on the rich biodiversity poses problem in management. Therefore, there is need to sensitize diverse stakeholders regarding protection and conservation of rich-bio resources of the region.

Preserving the diversity of species that share our home for the benefit of nature and people is an utmost necessity. Nature conservation helps promote biodiversity that leads to protecting the natural habitats of plants and animals help in preventing their extinction and promoting a healthy ecosystem. To mankind, the nature has given wonderful asset called 'resources', which needs to be conserved for the future sustainability of human beings.

I'm happy to know that under the joint collaborative "Him-Nature Learning Centre" project (supported by MoEF&CC, Govt. of India under NMHS) between Department of Forest & Environment, Government of Sikkim and G. B. Pant National Institute of Himalayan Environment (NIHE) the Sikkim Regional Centre of NIHE has developed an orchid trail in its arboretum "*Prakriti-Kunj*" and 51 species of orchids have been conserved through *in-situ/ex-situ* conservation.

I'm delighted that this pictorial booklet on 51 species of Orchid in "*Prakriti-Kunj*", which details about habitat, distribution, elevation range, description and key identification features of selected orchids, will be useful to diverse stakeholders including students, researchers, academicians, environmentalists, and nature enthusiasts and help in raising awareness towards the orchid diversity and congratulation. I congratulate the entire team of editors for bringing out this booklet.

(Shri M. L. Srivastava, IFS)
Addl. Chief Secretary - cum-PCCF
(HoFF)



Foreword

In the wake of increasing intense climatic and anthropogenic variations, the Himalaya has become a focal point as well as an effective indicator for sustainable development in the region and across the nation.

To establish the Science–Policy–Practice interface, G.B. Pant National Institute of Himalayan Environment (NIHE) serves and facilitates scientific knowledge and proven best practices for conservation and sustainable development of natural resources and associated environment in the entire Indian Himalayan Region (IHR).

Also recently, GBP NIHE is conferred with an IHR-dedicated “National Mission on Himalayan Studies (NMHS)” as the Nodal Institute for its implementation across the IHR. Under the NMHS, a Him-Nature Learning Centre (Him-NLC) is provisioned for each State or UT in the IHR, focussing on the merits and distinctions of each State/UT.

To achieve this, the Sikkim Region Centre of GBP NIHE has brought in-effect a collaboration with Department of Forest & Environment, Government of Sikkim for initiating and implementing the Him-NLC-Sikkim. The IHR State Sikkim is known and blessed with the plethora of Biodiversity, among which orchids are not only the centre of attraction for botanists, scholars, florists, horticulturists and other enthusiasts, but also act as an effective livelihood option for the local communities.

Under the Him-NLC-Sikkim, Orchid conservation through development of “Orchid Trails” is being successfully conducted in the arboretum “*Prakriti-Kunj*” of Sikkim Regional Centre (SRC) as one among other key components. Nearly 10% of orchid diversity of the state of Sikkim has been conserved through the Orchid trails, adding 51 orchids species inside the arboretum of SRC. Alongside enumerating these distinct orchid species, learnings out of this key component of Him-NLC are compiled in form this booklet “**Diversity of Orchids in *Prakriti-Kunj***”, thus regarding and conserving each variety of orchids found in the target region.

I appreciate the efforts of the NMHS-project team as well as Editors of the book for taking progressive steps towards improving the knowledge, spreading the awareness about, and bringing together the students, scholars, researchers and community at large towards conserving the unique diversity of orchids in Sikkim region.



(Er. Kireet Kumar)
Director In-Charge

6.9.2021



Preface

The forests, water resources and soils provide the necessities of the life- food, the air, the water. Increasing anthropogenic influence and changing ecological and climate regime has been a major concern for the nature. Further, the lack of awareness on the rich biodiversity causes problems in management of bio resources and hence it is required to educate and create awareness among diverse stakeholders, particularly the young minds needs to be sensitized and made aware about the rich bio-resources to protect, conserve and effectively utilize the available resources. Realizing this, a Nature Learning Centre (NLC) is being developed jointly by the Institute and Forest and Environment Department, Government of Sikkim at Pangthang with the support of National Mission on Himalayan Studies (NMHS) under the aegis of Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India. The objectives of the NLC include (i) development of easy learning module and knowledge products for school students & teacher, conservation workers, etc., (ii) Capacity building of different stakeholders – government, non-government and community level on building ecosystem resilience, (iii) Awareness programme and dissemination of knowledge on nature and biodiversity conservation, (iv) Sensitization programmes and conservation clubs for school and college students on regional and local biodiversity, (v) Development and demonstration of live models for conservation of natural resources, etc.

To address the objectives of the project, and considering that the Orchids are the spotlight of the biodiversity of Sikkim with nearly 560 orchid species found in the state, Sikkim Regional Centre of the Institute with support from BSI, SHRC, Gangtok and Forest and Environment Department, Government of Sikkim had developed an Orchid trail in its Arboretum known as “*Prakriti-Kunj*”. The Him-NLC is supported by the Ministry of Environment, Forest and Climate Change, Government of India under National Mission on Himalayan Studies (NMHS).

This booklet is a sincere effort to enumerate and describe the orchids and their diversity in the orchid trail developed in the Arboretum of the Institute with an aim create awareness on orchid conservation and diversity among students, research scholars, academics, tourist and other stakeholders. This booklet provides general information on orchids and its key identifications, special characters and richness in orchid trail of the institute. Orchid species described in this booklet are arranged alphabetically with its botanical name, common name, diagnostic feature, flowering periods, habitat and distribution

Editors



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Background

***Prakriti-Kunj* : Nature Learning Centre**

Sikkim state located in the adobe of Eastern Himalayan biodiversity hotspot, is rich in floristic biodiversity. The tremendous diversity of plants as well as a host of other life forms is yet to be explored. The lack of awareness on the rich biodiversity causes problems in management of bioresources and therefore, it is required that the local public and diverse stakeholders be sensitized and made aware of rich bio-resources for its protection and conservation. Under these contexts, there is a need to focus on transforming knowledge from diverse sources, across areas of scientific research and traditional knowledge into dissemination for conservation action. Realizing this, the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India under National Mission on Himalayan Studies (NMHS) promoted establishment of the state-of-art Himalayan-Nature Learning Centre (Him-NLC) in all Himalayan states including Sikkim. In Sikkim, the Him-NLC is being developed jointly by Forest and Environment Department, Government of Sikkim and GBPNiHE, Sikkim Regional Centre.

The broad objectives of Nature Learning Centre are (i) To develop a learning and interpretation centre for biodiversity conservation through various interactive models. (ii) To develop and demonstrate best practices on sustainable models such as, waste management, composting, water harvesting etc. (iii) To promote participatory conservation action and efficient utilization and management of natural resource base for livelihood generation, (iv) To promote eco-tourism for biodiversity conservation for livelihood generation, and (v) To build capacity of diverse stakeholders on conservation of resource base and develop of knowledge product for dissemination and awareness generation. Further NLC serves as a model for conservation of sensitive flora and fauna and serve as a field laboratory for conservation of biodiversity and interactive through promotion and highlight of flagship plant species and its habitats. NLC strengthens biodiversity knowledge base of the state and creates awareness amongst young minds, officials, tourists and locals.

The *Prakriti-Kunj*, an arboretum of institute along with its Bioresource Technology Centre serves as the study and implementation site for NLC. *Pakriti-kunj* with an area of 10 acres located near the periphery of Fambonglho Wildlife Sanctuary is rich in oaks, bryophytes, ferns, orchids, rhododendrons, medicinal plants and many other angiosperm species. *Prakriti-Kunj* has ample potential, which on one hand ensures to be *ex-situ* conservation of the representative plant species and on the other gives enriching and educational experiences to the visitors through hands on experience of natural elements. Besides, NLC include development of easy learning module and knowledge products for school children, teacher, conservation workers, SHGs, JFMC, BMC, young researchers, etc.

Orchid Trail

Orchids are flagship plant species, with immense ecological and economic value. They act as a good bio-indicators as they have low tolerance for change in environment and require mycorrhizal association for germination. Thus, the number of orchid species and their habitat are declining at accelerating pace due to changing climate, habitat destruction and insensitive extractions. Under the Him-NLC, orchid trail has been established in the heart of arboretum, with an aim to create an enabled environment for conservation of orchids and to spread awareness amongst researchers, academicians and nature conservationists.

Till date the orchid trail houses 51 epiphytic orchid species, belonging to 19 genera. Out of these, some species were rescued from the sites of road widening and construction from territorial division of Sikkim and rest through the *In-Situ* conservation at GBPNIHE, SRC, Pangthang campus and generous contribution of Botanical Survey of India, Sikkim Himalayan Regional Centre, Gangtok, Sikkim.

The germplasm of acquired orchid species are planted at suitable substrate in established trail for conservation and demonstration. The collected species belongs to 11 species of *Dendrobium*, 7 *Coelogyne*, 6 *Bulbophyllum*, 4 *Epigeneium*, 3 *Otochilus* and *Cymbidium*, 2 each of *Eria*, *Liparis*, *Pholidota* and *Pleione* and 1 each of *Acampe*, *Agrostophyllum*, *Cleisostoma*, *Cryptochilus*, *Gastrochilus*, *Oberonia*, *Thunia*, *Uncifera* and *Vanda*. The established trail represents the orchid diversity of the region and is important *ex-situ* conservation site for conservation education and demonstration. The trail, thus plays a key role in conservation of orchids and spreading awareness among diverse stakeholders towards nature conservation through environmental education. This booklet contains an inventory of orchid species found in the orchid trail of NLC at GBPNIHE, SRC with its pictorial identification. This information would help in improving understanding of orchid diversity and to address the gap in knowledge of orchid distribution.



Map of *Prakriti Kunj*

Main Entrance



Gate -1



Pond



Gate-2



Orchidarium



RTC

GBPNiHE, SRC
Premises



N

- *Prakriti Kunj* boundary
- Road
- Orchid trail
- Rhododendron trail

0 50 100
Meters



Orchids - An introduction

The orchid family, Orchidaceae, consisting of about 28,000 currently accepted species, 800 subspecies distributed in about 763 genera, is one of the two largest families of flowering plants, after Asteraceae. Many people have a fuzzy idea about orchid, but it is likely that most would not recognize all the species. So what is an orchid?

Orchids are divided into five sub families, Apostasioidae, Vanilloideae, Cyripedioideae, Epidendroideae and Orchidoideae based on DNA studies and morphology and reflects major differences in vegetative features and orchid flower construction. The largest genera of family Orchidaceae are *Bulbophyllum* (2,000 species), *Epidendrum* (1,500 species), *Dendrobium* (1,400 species) and *Pleurothallis* (1,000 species). In many ways orchids are enigmatic, attracting many generations of mankind with its incredible shapes and colours of their flowers. Orchids are found growing in a wide range of habitat with a different growth habit thus, all of them being perennial, mostly, partial shade loving and few total shade loving. Most of the orchids are found growing in the branches and tree trunks and known as epiphytes, whereas some of them grows on ground and called as terrestrials. Some species even grow on dead and decaying substratum and known as myco-heterotrophs. Interestingly, epiphytic orchids do not draw food from their host plant but only hold on to them for anchorage, but they draw moisture or nourishment from the air and humus collected in the bifurcated pits of branches or crevices of the bark. Some other are found growing completely on bare rocks or moss covered rocks and are known as lithophytes.

Orchids are exclusive and thus, require specific habitats for their growth and development. Indeed, their vulnerability towards habitat loss and environmental degradation, consider them as an ecological indicator. Thus, their disappearance indicating a change in the quality of soil and air of the region. Also, wild orchid species are used as traditional food and for a variety of folk medicines and cures by the local tribes of north-eastern region of India. While, Sikkim has a long history, of wild orchid conservation in their natural habitats in sacred groves, as orchids are closely associated with the socio economic culture of the local community. Sikkim, occupies second position in terms of orchid diversity in India. *Dendrobium nobile* being one of the most commonly grown orchid species, which is important both for ornamental and medicinal value, is declared as state flower of Sikkim.

Flower morphology

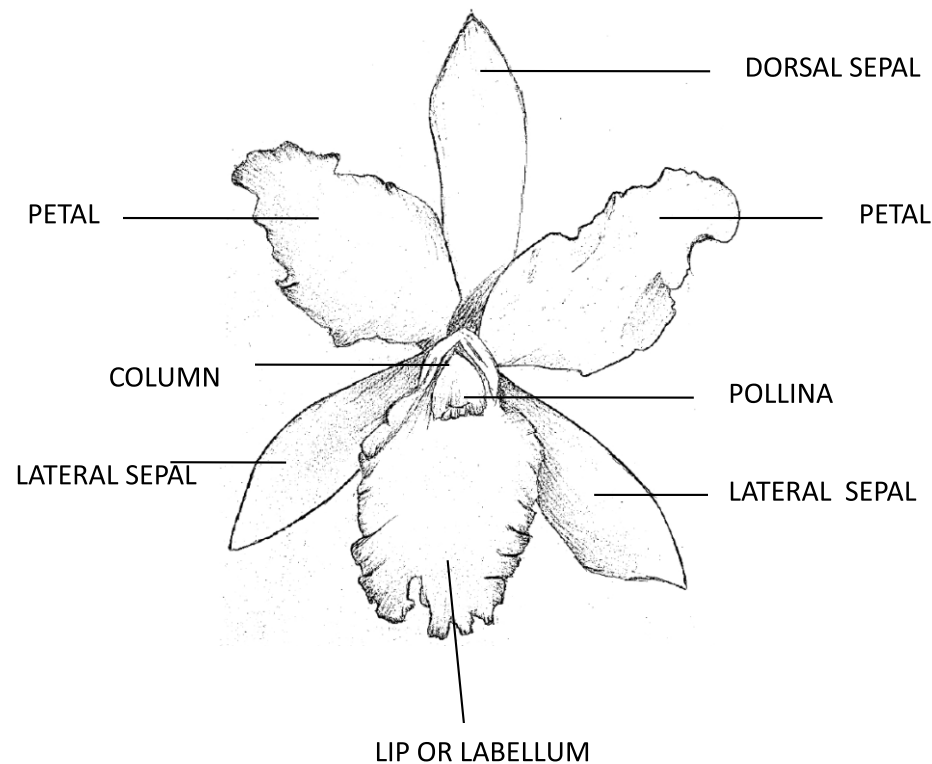
SEPALS: Orchids flowers consists of two rings, outer ring simply known as sepals, the uppermost symmetrical sepal called dorsal sepal and the two lateral sepals at the bottom of the flower.

PETALS: Petals are inner alternating rows of sepals, consisting of the two petals on either side of the flower and the lip or labellum usually at the base of the flower.

LIP: The lip (labellum) is a modified petal (one of three) that sits opposite from the fertile anther and usually highly modified from the other perianth segments. The labellum are of many different forms sometimes it is pouch-like or it may be fanned out, multi-colored and quite large. This serves variously as a landing platform, a flag to attract the prospective pollinators

COLUMN: It is a reproductive structure known as gynostemium, or column produced by the fusion of both male (stamen) and female (pistil) parts in the flower. It consists of male organ anther that bears the pollinia or pollen pellets and the female receptive organ, the stigma.

POLLINIA: Unlike few orchids which have powdery pollen, in most orchids the pollen grains are at least loosely bound together in masses or “pollinia”. At the top of the column, the pollen grains form golden yellow waxy masses called pollinia, which are contained in the anther cap. Pollinia are two or four soft fluffy masses which are bound together by “viscin” an elastic, somewhat viscid material derived from the tissues of the anther.



Growth Pattern

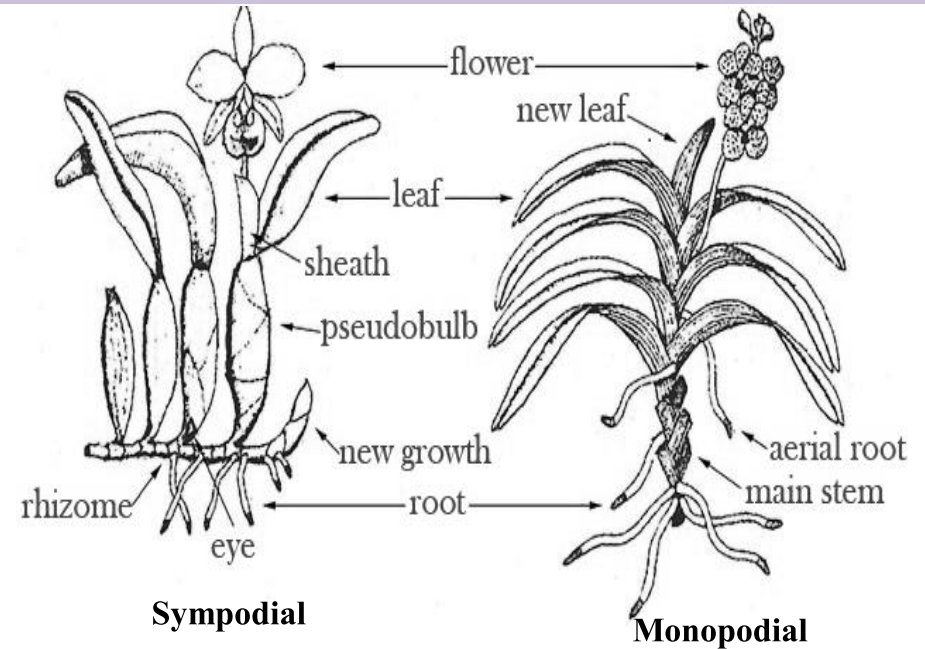
An orchid follows two distinct growth habits i.e sympodial and monopodial

➤ SYMPODIAL ORCHIDS:

Sympodial orchids have a lateral growth pattern in which each new shoot arises from the apical renewal bud or eye on the basal, rhizomatous part of the plant. The new growth enlarges into a swollen stem, the pseudo bulbs which are no true bulb, they are modified thickened stem adapted to store moisture and food. It has multiple growths and usually grows one or more new growth per year. *Cattleyas*, *Cymbidiums*, *Dendrobiums* and *Bulbophyllums* are Sympodial orchids with obvious pseudobulbs and orchids like *Paphiopedilums* and *Phragmipediums* are those without obvious pseudobulbs.

➤ MONOPODIAL ORCHIDS:

The monopodial orchids grows continuously upward, sprouting new leaves from the apex of the plant and inflorescences form from bud primordial in the leaf axils. These orchids grow from a horizontal stem. Thus, new growth being an extension of the growth of previous years. These usually have short, thick, joined and are produced alternately on either side of central axis (stem). Species of *Aerides*, *Cleisostoma*, *Cleisostemon*, *Pomatocalpa*, *Acampe*, *Vanda* etc. are most common monopodial orchids.



Orchids in Prakriti Kunj

***Acampe papillosa* (Lindl.) Lindl.** (Brittle orchid)

- Synonym : *Acampe carinata* (Griff.) Panigrahi
- Description : **Monopodial. Stem:** long with many nerves, lower portion covered in leaf sheath; **Leaves:** thick and long with rounded tip; **Inflorescence:** several, opposite to leaves, with many short branches, few to many flowered; **Flowers:** slightly fragrant, spreading; sepals and petals yellow with reddish brown horizontal stripes; **Lip:** with 3 lobe, generally long with broad sides; **Column:** square shaped, constricted in the middle two minute wings at the tip and base.
- Flowering : October-January
- Habit : Epiphytic
- Habitat : Tropical to Sub-tropical forests
- Elevation range : 300-600 m
- Distribution : India (Assam, Manipur, Meghalaya, Mizoram, Tripura, Arunachal Pradesh, Sikkim, West Bengal, Uttarakhand, Bihar, Jharkhand, Madhya Pradesh, Andhra Pradesh and Odisha), Bangladesh, Bhutan, Nepal, China, Myanmar, Thailand and Indo-China
- Key identification : Sepals and petals yellow with reddish brown transverse stripes





Agrostophyllum callosum Rchb.f. in B.Seemann

(Himalayan Grass-leaf Orchid)

- Description : **Sympodial. Stem:** cylindrical with slight taper, smooth, lower end of the stem is enveloped leaf sheaths; **Leaves:** many, long and narrow, tapering gradually from the base to the notched tip; **Inflorescence:** densely packed; **Flowers:** small reddish-purple, smooth; Sepals unequal, translucent purple; Petals broad at mid, rounded tip, translucent reddish-purple; **Lip:** joined at the base of column to form a shallow sac, translucent reddish-purple; **Column:** slightly winged and broad toward tip.
- Flowering : June-July
- Habit : Epiphytic
- Habitat : Sub-tropical to sub temperate forests
- Elevation range : 660 -2300 m
- Distribution : India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), Bangladesh, Bhutan, Nepal, China, Myanmar, Thailand and Indo-China
- Key identification: Plant blooms with short, densely several to many flowered head-like inflorescence at branch ends

***Bulbophyllum affine* Wall. ex Lindl.**

(Single Flowered Bulb-Leaf Orchid)

- Synonyms : *Bulbophyllum kusukusense* Hayata; *Phyllorchis affinis* (Lindl.) Kuntze
- Description : **Sympodial. Pseudobulbs:** cylindrical, wider at the base having ridges, young pseudo-bulb covered in leaf sheaths, stout; **Leaf:** narrowly elongated single leaf are thick and erect; **Inflorescence:** single flower arises from the base of pseudobulb or rhizomes; **Flowers:** smooth pale-green flowers with purple nerves; Sepals unequal oval to lance shaped, nearly pointed with 5-nerves; Petals lance shaped with pointed tip and 3 nerves; **Lip:** thickened and curved inward at the base with pointed to near pointed tip, the margins of the upper surface dark purple; **Column:** whitish yellow.
- Flowering : May-July
- Habit : Epiphytic
- Habitat : Evergreen lowland forests
- Elevation range : 800-1500 m
- Distribution : India (Assam, Manipur, Meghalaya, Nagaland, Arunachal Pradesh, Sikkim, West Bengal and Uttarakhand), Nepal, Bhutan, China, Myanmar, Japan, Thailand and Indo-China
- Key identification : Small sized plant with pale green flower having purple nerves



***Bulbophyllum careyanum* (Hook.) Spreng.**

(Carey's Bulb-Leaf Orchid)



Synonyms	: <i>Anisopetalon careyanum</i> Hook.; <i>Bulbophyllum careyanum</i> var <i>ochracea</i> Hook.f.
Description	: Sympodial. Pseudobulbs: are erect, egg shaped, green or pale-green; Leaf: single arising from tip of pseudobulb, pale-green; Inflorescence: approximately cylindrical, smooth, deep violet, arising from the base of pseudobulb; Flowers: overlapping dark-purple and shining; Sepals are unequal, pale-green with 5-dark-purple nerves; Petals are narrowly triangular, tapering to tail like tip with teeth like edges; Lip: movable, dark violet, narrowly egg shaped, round to pointed tip with a broad base; Column: slightly arched, short and smooth and yellow colored.
Flowering	: October-March
Habit	Epiphytic or Lithophytic
Habitat	: Evergreen lowland forests.
Elevation range	: 500-2000 m
Distribution	: India (Assam, Manipur, Arunachal Pradesh, Meghalaya, Nagaland, Sikkim, Uttarakhand, West Bengal, Andhra Pradesh and Odisha), Bhutan, China, Myanmar, Nepal, Thailand and Indo-China
Key identification	: Plant blooms in the winter and spring lateral to hanging, many flowered inflorescence

***Bulbophyllum guttulatum* (Hook.f.) N.P.Balakr.**

(Small-Spotted Bulb-Leaf Orchid)

- Synonyms : *Cirrhopetalum guttulatum* Hook.f.; *Phyllorchis guttulata* (Hook.f.) Kuntze
- Description : **Sympodial. Pseudobulbs:** are egg shaped with banded ridges, becoming smaller or shrinking when old; **Leaves:** are single arising from tip of pseudobulb, inverted- lance shaped, slightly notched at tip, gradually narrowing below into the channeled stalked base; **Inflorescence:** erect, from the base of pseudobulb; **Flowers:** pale-yellow with purple spots; Ssepal broadly egg shaped, inwardly curved; Petals wide and short, ending abruptly with 3-nerves, yellow colored spotted with purple; **Lip:** much bent from the middle, long, minutely bi-lobed, white with minute purple spots; **Column:** short, with broad triangular sideward wings.
- Flowering : June-September
- Habit : Epiphytic or Lithophytic
- Habitat : Broad-leaved hill forests
- Elevation range : 800-2500 m
- Distribution : India (Manipur, Meghalaya, Nagaland, Arunachal Pradesh, Sikkim, West Bengal and Odisha) China, Nepal, Bhutan, Myanmar and Indo-China
- Key identification : Single, apical, inverted-lance shaped, blunt leaf



***Bulbophyllum leopardinum* (Wall.) Lindl. ex Wall**

(Leopard Spotted Bulbophyllum)



- Synonyms** : *Bulbophyllum leopardinum* var. *leopardinum*; *Dendrobium leopardinum* Wall.
- Description** **Sympodial. Pseudobulbs:** are compressed, slanting on very short rhizome, lower part covered in fibrous sheaths; **Leaf:** single leaf at the tip of pseudobulb, broad and long with rounded tip; **Inflorescence:** few stalked flower arising from the base of pseudobulb. **Flowers:** pale yellow scattered with scarlet spots; Sepals are slightly unequal, thick, translucent and pale-yellow with scarlet spots, with 9 nerves; Petals are long egg shaped with pointed tip and 7 nerves, translucent yellow with scarlet spots; **Lip:** thick, fleshy, pale-white with scarlet red patches, bent from below mid point; **Column:** with triangular wing, yellow.
- Flowering** : July-October
- Habit** : Epiphytic or Lithophytic
- Habitat** : Sub-tropical and temperate forests
- Elevation range** : 1200-3000 m
- Distribution** : India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim, West Bengal and Uttarakhand), Bhutan, Myanmar, Nepal, China, Thailand and Indo-China
- Key identification** : Flowers pale-yellow with purple Leopard-like spots

Bulbophyllum odoratissimum **(Sm.) Lindl. var odoratissimum** (Fragrant Bulbophyllum)

- Synonyms : *Bulbophyllum congestum* Rolfe; *Stelis odoratissima* Sm.
- Description : **Sympodial. Pseudobulbs:** are cylindrical and erect with shiny pale yellow color; **Leaf:** are erect, long with broad at mid, tip rounded with a cut; **Inflorescence:** long, erect, from the base of pseudobulb; **Flowers:** fragrant, white with orange-yellow lip, shiny and spreading; **Sepals:** spreading, white to pale-yellow, margin enrolled to form cylindrical tip; **Petals** are pointed and one nerved with translucent white color; **Lip:** elongated egg shaped, nearly pointed, slightly curved, orange-yellow, and hairy; **Column:** white, smooth and short.
- Flowering : May-July
- Habit : Epiphytic or Lithophytic
- Habitat : Evergreen forests
- Elevation range : 800-2500m
- Distribution : India (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh Sikkim, West Bengal and Andaman & Nicobar Islands), Bhutan, China, Myanmar, Nepal, Thailand, Indo-China
- Key identification : Cluster of strongly fragrant flower, lip with glandular hairs





***Bulbophyllum reptans* (Lindl.) Lindl.** (Crawling Bulbophyllum)

Synonyms	: <i>Bulbophyllum clarkei</i> Rchb.f.; <i>Bulbophyllum grandiflorum</i> Griff.
Description	: Sympodial. Pseudobulbs: are waxy and shiny with bottle green color, often suffused with purplish-brown, covered completely in tight fibrous sheath upto tip; Leaf: single, narrow and long, nearly pointed, deep slanted notch at tip, dark-green above and pale-green below; Inflorescence: three or less flowered, almost erect; Flowers: are pale-green, with dark purple spots; Sepals are nearly equal, drifted towards tip with 3-nerves, pale green, with dark-purple spots; Petals broad at middle and long, blunt at end, 1-nerved, translucent pale green; Lip: long and rectangular, grooved at the base, tip narrow and almost pointed, margin winged, pale green with two dark-purple bands from base to apex ; Column: with short sidewise wings.
Flowering	: October -December
Habit	Epiphytic
Habitat	: Evergreen broad-leaved subtropical and temperate forests.
Elevation range	: 1200–2500 m
Distribution	: India(Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim, West Bengal and Uttarakhand), Bangladesh, Bhutan, Myanmar, China, Nepal, Thailand and Indo-China
Key identification	: Flowers pale-green to orange-yellow with dark-purple spots, Inflorescence peduncle

Cleisostoma linearilobatum (Seidenf. & Smitinand) Garay

(Linear-Lobed Cleisostoma)

Synonyms	: <i>Cleisostoma sagittiforme</i> Garay; <i>Cleisostoma siikkimense</i> Lucksom
Description	: Monopodial. Stem: slightly curved, branched, covered with leaf sheaths; Leaves: narrow and long, slightly lobed at tip, slightly contracted at sheathing base; Inflorescence: loosely branched cluster, perpendicular to the main axis, many flowered; Flowers: greenish-purple, smooth, spreading. Sepals are slightly unequal, spreading, pale-green with 2-distinct bands of brown; Petals are long egg shaped, rounded tip, pale-green with 2-bands of deep brown; Lip: 3-lobed with erect side lobes, triangular, purple with its tip pointing forward.
Flowering	: June-July
Habit	: Epiphytic
Habitat	: Lowland sub-tropical forests
Elevation range	: 500–2000 m
Distribution	: India (Meghalaya, Arunachal Pradesh and, Sikkim), Bhutan, China, Myanmar, Malaysia, Thailand and Indo-China
Key identification	: Flowers green with red-brown marking, lip pink in colour with prominent spur



Coelogyne corymbosa Lindl. (Clustered Coelogyne)

- Synonym : *Pleione corymbosa* (Lindl.) Kuntze
- Description : **Sympodial. Pseudobulbs:** egg shaped or inverted egg shaped, smooth, pale-green, sheaths at base partially covering the pseudobulbs; **Leaves:** narrow and long with broad at mid and pointed tip, well defined five nerves taper towards stalkless base, dark-green above and pale-green below; **Inflorescence:** cluster of stalked flower appearing before or with leaves, embraced by sheaths below middle; **Flowers:** pure white, fragrant; Sepals are slightly unequal, curved inward; Petals are roughly rectangular and nearly pointed with five nerves; **Lip:** rectangular to egg shaped with three lobes and round tip; **Column:** are curved, slightly winged towards the tip.
- Flowering : March-July
- Habit : Epiphytic or lithophytic
- Habitat : Sub-tropical and temperate forests
- Elevation range : 1800-2800 m
- Distribution : India (Assam, Manipur, Meghalaya, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), Bhutan, Nepal, China and Myanmar
- Key identification : White flower with yellow crests on the lip



Coelogyne cristata Lindl. (Crested Coelogyne)

- Synonyms : *Coelogyne cristata* var. *hololeuca* Rchb.f.; *Cymbidium speciosissimum* D.Don
- Description : **Sympodial. Pseudobulbs:** cylindrical to egg shaped, polished, with long sheaths at the base partially covering the pseudobulbs, shrinks during flowering; **Leaves:** comes in pair, narrowly elongated with pointed tip, narrow base without stalk; **Inflorescence:** opening in succession and hanging from the base of most matured pseudobulb; **Flowers:** white, sweet scented; white sepals are slightly unequal, elongated with wavy margin; Petals elongated with 3 lobes; **Lip:** elongated with 3-lobes; **Column:** pure white column is hooded and notched at tip.
- Flowering : January-May
- Habit : Epiphytic or Lithophytic
- Habitat : Sub-tropical forests
- Elevation range : 1500-1800 m
- Distribution : India (Assam, Manipur, Meghalaya, Nagaland, Arunachal Pradesh, Sikkim, West Bengal, Himachal Pradesh and Uttarakhand), Bangladesh, Bhutan, Nepal and China
- Key identification : Flowers pure white in hanging cluster with finely divided golden-yellow crest on the lip





Coelogyne flaccida Lindl. (Loose Coelogyne)

Synonyms	: <i>Coelogyne esquirolii</i> Schltr.; <i>Pleione flaccida</i> (Lindl.) Kuntze
Description	: Sympodial. Pseudobulbs: are cylindrical to egg shaped with narrow channels and covered in fibrous sheath at base.; Leaves: narrowly rectangular tapering to a point in tip and narrow channel at base; Inflorescence: arise from the base of pseudobulb and is curved downward; Flowers: creamy yellowish-white with slight fragrance; Sepals elongated with blunt at both end and are slightly unequal with distinct three nerves; Petals are wide at mid with tapering ends; Lip: are egg shaped with three lobes; Column: are winged with broad hood at the tip, pure white with 2-longitudinal yellowish-brown streaks in front.
Flowering	: March-April
Habit	Epiphytic or Lithophytic
Habitat	: Sub-tropical forests
Elevation range	: 1500-1800 m
Distribution	: India (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), Bangladesh, Bhutan, China, Myanmar, Nepal, Thailand and Indo-china
Key identification	: Inflorescence long, pendulous, flowers pale-yellow having unpleasant fragrant

Coelogyne fuscescens Lindl. (Ocher Yellow Coelogyne)

- Synonyms : *Coelogyne brunnea* Lindl.; *Coelogyne cynoches* E.C.Parish & Rchb.f.
- Description : **Sympodial. Pseudobulbs:** dark green and smooth pseudobulb are cylindrical in shape with grooves in older ones, basal end is enveloped in overlapping bracts; **Leaves:** at the tip of pseudobulb with wider mid and pointed tip and narrow stalked base; **Inflorescence:** arises before leaves from the base of mature pseudobulb; **Flowers:** yellowish to pinkish-brown and smooth; Sepals slightly unequal with pinkish brown color; Petals long and narrow with pointed tip, color same as sepal; **Lip:** nearly rectangular with blunt end with three lobes; **Column:** curved and irregularly winged at the tip.
- Flowering : October-January
- Habit : Epiphytic
- Habitat : Epiphytic in the sub-tropical forests
- Elevation range : 1200-1800 m
- Distribution : India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), Bhutan, Myanmar, Nepal, China, Thailand and Indo-China
- Key identification : Flowers pale yellow to pinkish-brown in colour, lip with three very prominent orange-red colored crests





Coelogyne ovalis Lindl. (Oval Coelogyne)

- Synonyms : *Coelogyne decora* Wall. ex Voigt; *Coelogyne fuliginosa* Lodd. ex Hook.
- Description : **Sympodial. Pseudobulbs:** narrowly cylindrical with irregular fissure; **Leaves:** narrow and long with pointed tip, 9 nerves distinct in lower surface of leaf, dark green above and pale-green below; **Inflorescence:** 2 or 3 flowered, opening in succession; **Flowers:** light pinkish-brown, tinged with green, wide open; Sepals are elongated egg shaped with pointy tip, cream suffused with light pink or tinged with green; Petals are narrowly long with pointed tip and single-nerve, colour same as sepals; **Lip:** generally elongated with blunt end, 3-lobed, curved; **Column:** hooded wing at the slightly notched tip .
- Flowering : July-December
- Habit : Epiphytic or Lithophytic
- Habitat : Sub-tropical to temperate forests
- Elevation range : 1200-3000 m
- Distribution : India (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Arunachal Pradesh, Sikkim, West Bengal and Uttarakhand), Bhutan, Nepal, China, Myanmar, Thailand and Indo-China
- Key identification : Few light pinkish-brown flowered inflorescence arising on a mature pseudobulb

Coelogyne prolifera Lindl. (Yellowish Coelogyne)

- Synonyms : *Coelogyne flavida* Hook.f. ex Lindl.; *Pleione prolifera* (Lindl.) Kuntze
- Description : **Sympodial. Pseudobulbs:** pale-yellow elongated egg shaped, shrinks at the time of flowering, grooved, smooth and long sheath cover the base; **Leaves:** arises in pair, narrowly long with wider at mid, tapering sharply towards both end; **Inflorescence:** opens in succession and elongates every year and varying in length from 10-37 cm; **Flowers:** smooth and shiny, yellowish-green, 3-nerved, lower sepal egg shaped, bluntly pointed; Petals narrowly elongated with rounded tip; **Lip** with three lobes, curved, short and round at the base; **Column:** straight, very slightly winged near the tip.
- Flowering : May- June
- Habit : Epiphytic
- Habitat : Sub-tropical to temperate forest
- Elevation range : 1000-2200 m
- Distribution : India (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), Bhutan, China, Myanmar, Nepal, Thailand and Indo-China
- Key identification : Orchids blooms out of the previous years inflorescence as well as new ones





***Coelogyne stricta* (D. Don) Schltr.**

(Erect Coelogyne)

- Synonyms : *Coelogyne elata* Lindl.; *Cymbidium strictum* D. Don
- Description : **Sympodial. Pseudobulbs:** thinly placed on rhizome, elongated or narrowly egg shaped with 2 leaves at apex; **Leaves:** narrowly long with broad at mid and pointed at both end; **Inflorescence:** arise in succession and are erect; **Flowers:** whitish-yellow to light shade of pink; Sepals slightly unequal elongated and wide open, white or white flushed with pink; Petals narrow and long with slightly pointed tip, wide open; **Lip** almost round with tip divided into distinct section, white but with two yellow blotches at the base; **Column:** winged in its upper half, wing cut at the apex, white.
- Flowering : March-June
- Habit : Epiphytic or Lithophytic
- Habitat : Sub-tropical to temperate forests
- Elevation range : 1000-2200 m
- Distribution : India (Meghalaya, Manipur, Mizoram, Nagaland, Arunachal Pradesh, Sikkim, West Bengal and Uttarakhand), Bhutan, Nepal, China, Myanmar and Indo-China
- Key identification : Flower-cluster-stalk arising between the leaves from the tip of the adult bulbs

Cryptochilus sanguineus Wall

(The Blood-Red Cryptochilus)

- Description : **Sympodial. Pseudobulbs:** egg-shaped enveloped at base by sheaths; **Leaves:** leathery, elongated with broad at mid, drooping, pointed, bright green; **Inflorescence:** 1 at tip, erect, developed from a young pseudo-bulb; **Flowers:** scarlet tubular with soft hairs; Sepals united to form a tube, outer surface with dense white hairs; Petals hidden in mentum, inverted lance shaped with blunt end, yellow with reddish-purple shade at the tip; **Lip:** inward curved, elongated, slightly broader at the tip and cup shaped base, smooth, movable, yellow, but sometimes with reddish-purple tinge at the tip; **Column:** stout and covered in fine hairs.
- Flowering : June-August
- Habit : Epiphytic
- Habitat : Sub-tropical and temperate forests
- Elevation range : 1500-2200 m
- Distribution : India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), Bhutan, Nepal, China and Myanmar
- Key identification : Inflorescence develops along with the new growth, bearing many flowers on two rows, facing one side





Cymbidium elegans Lindl. (Elegant Cymbidium)

- Synonyms : *Cymbidium densiflorum* Griff
- Description : **Sympodial. Pseudobulbs:** enveloped in persistent leaf bases; **Leaves:** arranged alternately in opposite vertical row, strap formed, tip pointed or rounded with 2 lobes; **Inflorescence:** arising from lower part of pseudobulbs, usually curved, rachis hanging or nodding, densely packed 18-35 flowered; **Flowers** with slight fragrant, hanging, narrowly bell-shaped, not opening widely; **Sepals:** narrowly elongated with inverted egg shaped; **Petals:** broadly linear with blunt tip; **Lip:** inverted lance shaped to triangular base fused to basal margins of column for 2-3 mm, 3-lobed; **Column:** hairy toward base, narrowly winged
- Flowering : October- January
- Habit : Epiphytic or Lithophytic
- Habitat : Sub-tropical to temperate forests
- Elevation range : 1000-2800 m
- Distribution : India (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), Bhutan, Myanmar, Nepal, China, and Indo-China
- Key identification : Flowers spike arching with 18 to 35 flowers, flowers are straw yellow and long lasting

Cymbidium erythraeum Lindl.

(Red -Spotted Lip Cymbidium)

Synonyms	: <i>Cymbidium longifolium</i> auct. non D. Don .: Lindl.; <i>Cymbidium hennisianum</i> Schltr.
Description	: Sympodial. Pseudobulbs: egg shaped with flat sides; Leaves: many, narrowly linear, acuminate one side of the midrib just short of other at the tip; Inflorescence: arising from within sheaths at base of pseudobulb, nearly erect; Flowers: pale lemon yellow often flushed with pink or brown, slightly opening at the tip, smooth; sepal and petal green with heavy reddish brown longitudinal stripes; Lip: narrowly elongated with three lobes, white in colour but streaked and blotched with reddish-purple; Column: slender, slightly winged at the tip, base broad, sparsely hairy.
Flowering	: September-November
Habit	: Epiphytic or Lithophytic
Habitat	: Sub-tropical and temperate oak mixed forests
Elevation range	: 1400-2800 m
Distribution	: India (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), Bhutan, Nepal, China, Myanmar, and Indo-China
Key identification	: Inflorescence produced in autumn, carrying 6-14 pale-green spotted and striped red-brown fragrant flowers





Cymbidium insigne Rolfe (Splendid Cymbidium)

- Synonyms : *Cymbidium insigne* var. *album* O'Brien
- Description : **Sympodial. Pseudobulbs:** narrowly egg shaped, slightly flattened enclosed in leaf bases; **Leaves:** 6-9 with strap and jointed base and sharply pointed tip; **Inflorescence:** nearly erect and strong; **Flowers:** not scented, sepals and petals white or pinkish, sometimes with red spots at base; **Lip:** white often with purplish red spots and stations particularly on lateral lobes and with a central yellow patch on mid-lobe; **Column:** bow shaped, winged and hairy at base on upper surface.
- Flowering : November-December
- Habit : Terrestrial or lithophytic
- Habitat : Subtropical and sub-temperate forests.
- Elevation range : 1000-2000 m
- Distribution : India (Manipur, West Bengal and Sikkim), China, Thailand and Indo-China
- Key identification : Loosely several to many flowered inflorescence and carrying, non-fragrant, close set flowers

***Dendrobium amoenum* Wall. ex Lindl.** (Lovely Dendrobium)

- Synonyms : *Callista amoena* (Wall.ex Lidl.) Kuntze; *Dendrobium egertoniae* Lindl.
- Description : **Sympodial. Stem:** thin hanging stem with thick nodes, covered in translucent sheaths; **Leaves:** nearly rectangular with more pointed end at the base, slanting, slightly tapering towards base to form long stem enclosing sheaths; **Inflorescence:** many, bundled, from nodes of leafless stem; **Flowers:** white with sepals and petals tipped with purple colour and slightly fragrant; Sepals nearly unequal, elongated with broad lower half and rounded tip, spreading; Petals egg shaped with rounded tip, spreading; **Lip:** elongated with upper half broad, clawed at the base with 3-lobes; **Column:** white, slightly tapering towards base.
- Flowering : May-June
- Habit : Epiphytic or Lithophytic
- Habitat : Sub-tropical to temperate forests
- Elevation range : 1000-2500 m
- Distribution : India (Assam, Meghalaya, Arunachal Pradesh, Sikkim, West Bengal, Himachal Pradesh and Uttarakhand), Bangladesh, Bhutan, Nepal, and Myanmar
- Key identification : Flowers are borne in pairs from nodes of pendulous leafless stem, Sepal and petals white with violet tips, lip white ,yellow towards the middle



Dendrobium aphyllum (Roxb.) C.E.C.Fisch. (Leafless Dendrobium)



- Synonyms** : *Cymbidium aphyllum* var *cucullatum* (R.Br.) P.K. Sarkar; *Dendrobium cucullatum* R.Br.
- Description** : **Sympodial. Stem:** hanging thin and swollen nodes, enveloped in tight tube like sheaths; **Leaves:** are many, lance-shaped, nearly pointed, tapering towards sheathing base; **Inflorescence:** a bundle of 1-3 stalked flowers arising from slightly swollen nodes of leafless stem; **Flowers:** purplish-white; Sepals smooth with five nerves and with distinct netted venation, spreading; Petals broad at mid with rounded tip, purplish-white; **Lip:** trumpet-shaped, pale yellow or less often white, densely covered with soft, short hair outside and along margins; **Column:** broad, externally white but with purple lining inside.
- Flowering** : April-June
- Habit** : Epiphytic
- Habitat** : Open forests in tropical and subtropical areas.
- Elevation range** : 340-1660 m
- Distribution** : India (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Arunachal Pradesh, Sikkim, West Bengal, Odisha, Chhattisgarh, Madhya Pradesh and Andaman & Nicobar Islands), Bangladesh, Bhutan, Nepal, Thailand, Malaysia and Indo-China
- Key identification** : Pendulous stems carrying many, thin, lance-shaped, deciduous leaves, flowers are flimsy and short lived

***Dendrobium bicameratum* Lindl.**

(Short Flower Dendrobium)

Synonyms	: <i>Callista bicamerata</i> (Lindk.) Kuntze; <i>Callista bolboflora</i> (Falc.ex Hook.f.) Kuntze
Description	: Sympodial. Pseudobulbs: tapering towards both ends and slightly zigzag, tubular stem clasping sheaths, arising from nodes and enveloping internodes; Leaves: many alternate, elongated lance shaped, obliquely divided into two; Inflorescence: sub-capitate, arising from the nodes of leafless pseudobulbs; Flowers: are crowded in a short stalk covered in sheath, pale-green with slight streaks of purple, spreading, Smooth; Sepals are slightly unequal and curved inward; Petals are elongated egg shaped with slightly pointed tip, translucent pale-green with slight streaks of purple spreading; Lip: broadly elongated egg shaped with three lobes; Column: with wider base and tapering tip, pale-green with reddish purple lining.
Flowering	: July-September
Habit	: Lithophytic
Habitat	: Sub-tropical to temperate forests
Elevation range	: 1200-2500 m
Distribution	: India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim, West Bengal, Uttarakhand, Odisha and Jharkhand), Bhutan, Myanmar and Nepal
Key identification	: Flowers yellow with stripes of red speckles ,golden yellow lip





***Dendrobium chrysanthum* Wall. ex. Lindl.**

(Golden flowered Dendrobium)

- Synonyms : *Callista chrysantha* (Wall. ex Lindl.) Kuntze; *Dendrobium paxtonii* Lindl.
- Description : **Sympodial. Stem:** dark green except where covered with membranous white striped tubular sheaths tapering slightly at both the ends; **Leaves:** many-nerved but with 3-prominent nerves on upper surface, base rounded with long tubular stem clasping sheaths; **Inflorescence:** 2-6-flowered on upper part of mature leafy stems; **Flowers:** thickly textured, yellow; Sepals are orange-yellow fleshy with externally keeled with lightly concave surface; Petals are orange-yellow entire or minutely toothed with concave surface; **Lip:** orange-yellow with two dark nearly circular spots of dark purple; **Column:** approx. 4 mm
- Flowering : May-October
- Habit : Epiphytic or Lithophytic
- Habitat : Moist tropical to temperate forests
- Elevation range : 500-2100 m
- Distribution : India (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim, West Bengal and Uttarakhand), Bhutan, Nepal, China, Myanmar, Thailand, Laos and Indo-China
- Key identification : Flowers on upper surface of stem, yellow flowered with chestnut blotch

***Dendrobium densiflorum* Lindl. ex Wall.**

(Pineapple Orchid)

Synonyms	:	<i>Callista densiflora</i> (Lindl.) Kuntze; <i>Dendrobium clavatum</i> Roxb.
Description	:	Sympodial. Pseudobulbs: larger one at one end, with noticeable internodes; Leaves: clustered near apex, elongated with tapering at both end; Inflorescence: hanging from the tip with many flower, 15-20 cm long; Flowers: thin and semi-translucent. Sepal and Petal yellow; Lip: orange, paler towards margin; Column: broad at middle, 7 mm long.
Flowering	:	April-June
Habit	:	Epiphytic
Habitat	:	Tropical to sub-tropical forests
Elevation range	:	400-1500 m
Distribution	:	India (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Arunachal Pradesh and West Bengal), Bangladesh, Bhutan, Nepal, China, Myanmar and Thailand
Key identification	:	Bright yellow densely packed flowers. Lip pubescent, orange yellow with wavy margin



***Dendrobium fimbriatum* var. *oculatum* Hook.**

(Fringe-Lipped Dendrobium)

- Synonyms : *Callista oculata* (Hook.) kuntze
- Description : **Sympodial. Pseudobulbs:** thickest at the middle with nodes and internodes, internodes slightly furrowed; **Inflorescence:** one or two; **Flowers:** bright yellow, with a large spherical patch of rich reddish-brown at the throat of the lip; Sepals yellow, widely extending and slightly fleshy; Petals elongated with regular egg-shaped ends, rounded at the tip, orange-yellow; **Lip:** curled, projecting out and spreading, having soft, downy hairs, tubular enclosing the column, dark purple; **Column:** punctured, lined with purple almost circular nectar secreting gland.
- Flowering : April-June
- Habit : Epiphytic
- Habitat : Tropical to temperate forests
- Elevation range : 300-2200 m
- Distribution : India (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Arunachal Pradesh, Sikkim, West Bengal, Uttarakhand, Odisha, Jharkhand, Bihar and Madhya Pradesh), Bangladesh, Myanmar, Bhutan, China, Thailand , Malaysia, Nepal and Indo-China
- Key identification : Bright yellow flower, reddish brown orbicular patch at the throat of lip



Dendrobium hookerianum Lindl.

(Hooker's Dendrobium)

Synonyms	: <i>Casllista hookeriana</i> (Lindl.) Kuntz; <i>Dendrobium chrysotis</i> Rchb.f.
Description	: Sympodial. Stem: fixed and un-branched with many nodes with internodes pale yellow when dry; Leaves: alternate along entire stem, leaf sheath tightly clasping stem; Inflorescence: one to several in the distant part of current season's mature leafy stems; Flowers: golden-yellow, with two oblique purple blotch on the lip; Sepals & Petals golden-yellow with seven-nerves; Lip: nearly circular, with two oblique oval dark-purple blotches on the disc; Column: pure white, with lower part consisting two short vertical bands.
Flowering	: April-May or September-October
Habit	Epiphytic
Habitat	: Subtropical to temperate forest.
Elevation range	: 1000-2300 m
Distribution	: India (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), Bhutan, Myanmar, China and Nepal
Key identification	: Inflorescence outward spreading often at 90 degree angle to stem





***Dendrobium longicornu* Lindl.**

(Long-Horned Dendrobium)

Synonyms	: <i>Dendrobium hirsutum</i> Griff.; <i>Dendrobium bulleyi</i> Rolfe
Description	: Sympodial. Pseudobulbs: thin clustered and erect, covered with short coarse black hairs; Leaves: many, narrow with broad base, pointed tip but slightly unequally lobed, smooth tapering towards tubular stem clasping sheaths; Inflorescence: arising at the tip on leafless stem; Flowers: white with orange yellow lip. Sepals slightly unequal, closed with slight opening at the mouth; Petals egg shaped, with pointed tip, white; Lip: broadly triangular (when spread out) 3-lobed; Column: ca. 5 mm, teeth triangular.
Flowering	: August-November
Habit	: Epiphytic
Habitat	: Epiphytic in the mixed and coniferous forests
Elevation range	: 1200-2500 m
Distribution	: India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim, West Bengal and Uttarakhand), Bangladesh, Bhutan, Nepal, China, Myanmar and Indo-China
Key identification	: Deciduous leaves , flowers white, fragrant, pointing downward and long-lasting

***Dendrobium nobile* Lindl.**

(Noble Dendrobium)

Synonyms	:	<i>Dendrobium coerulescens</i> Lindl.; <i>Callista nobilis</i> (Lindl.) Kuntze
Description	:	Sympodial. Stem: thick at middle and tapers at both ends that becomes yellow on maturity; Leaves: many with sheathing base, alternate; Inflorescence: 3-5 per plant, arising from the nodes below the leaves; Flowers: whitish purple; Sepals purplish white with six nerved, slightly fleshy; Petals five nerved near the margin branched; Lip: trumpet shaped covered with downy hairs; Column: broad with tapering base.
Flowering	:	March-May
Habit	:	Epiphytic
Habitat	:	Tropical to subtropical broadleaved forests
Elevation range	:	500 – 1700 m
Distribution	:	India (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), Bangladesh, Bhutan, China, Myanmar, Nepal, Thailand and Indo-China
Key identification	:	Whitish purple flower, stem becomes yellow on maturity





***Dendrobium ochreatum* Lindl.**

(Stem Clasping Tube Dendrobium)

- Synonyms : *Callista ochreate* (Lindl.) Kuntze; *Dendrobium cambridgeanum* Paxton
- Description : **Sympodial.** **Stem:** short membranous having membranous scales; **Leaf:** egg-shaped tapering from rounded base toward the apex, narrowly pointed at apex; **Inflorescence:** unbranched with many stalked flowers; **Flowers:** bright yellow; Sepals egg-shaped with lower sepal wider than lateral sepals; Petals wider than sepals, glossy, nearly heart-shaped with apex notched usually at the apex; **Lip:** hairy at margin encircling the column, dark maroon blotches inside.
- Flowering : April-May
- Habit : Epiphytic
- Habitat : Epiphytic or Lithophytic in the Subtropical broadleaved forests.
- Elevation range : 1000-1500 m
- Distribution : India (Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Arunachal Pradesh and West Bengal), Bangladesh, Nepal, Myanmar and Thailand
- Key identification : Membranous scale in stem, bright yellow flowers with dark maroon blotches

***Dendrobium stuposum* Lindl.**

(Flax like Dendrobium)

Synonyms	:	<i>Callista flavidula</i> (Ridl. ex Hook.f.) Kuntze; <i>Callista stuposa</i> (Lindl.) Kuntze
Description	:	Sympodial. Pseudobulbs: tapering towards both ends, covered in left over of leaf sheath; Leaves: many, alternate-opposite, unequally divided with stem clasping base; Inflorescence: 1 or 2 from the nodes of leafless pseudobulbs; Flowers: slightly spreading, pure white but with orange yellow spot on the lip; Sepals are pure-white bearing five nerves; Petals pure-white carrying distinctly three nerves, shortly clawed; Lip: 3-lobed, egg-shaped with elongated blunt end; Column: broad, white, tapering towards base.
Flowering	:	June-August
Habit	:	Epiphyte
Habitat	:	Tropical to sub-tropical forests
Elevation range	:	400-1800 m
Distribution	:	India (Assam, Manipur, Mizoram, Nagaland, Sikkim, Arunachal Pradesh, Meghalaya and West Bengal), Bhutan, China, Myanmar, Indonesia , Malaysia, Philippines and Thailand
Key identification	:	Stem covered in remnant of leaf sheath giving whitish appearance





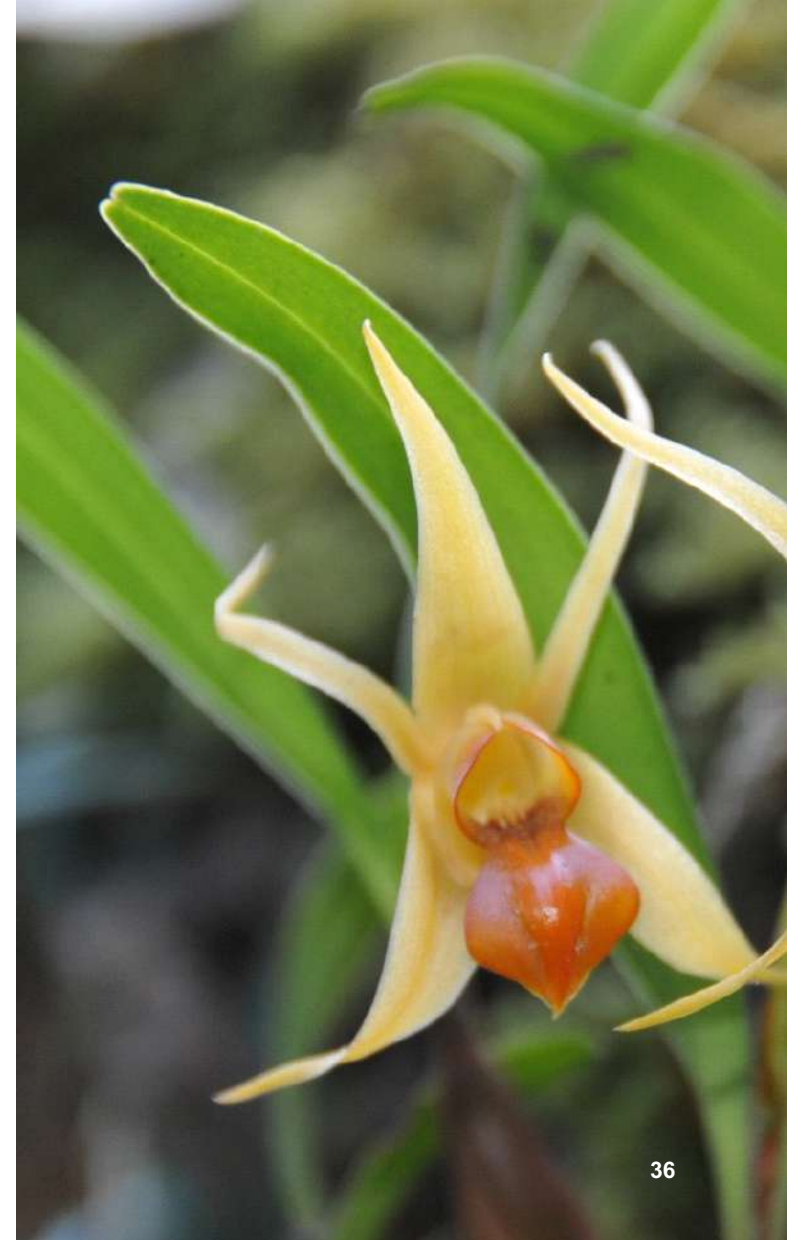
Epigeneium amplum (Lindl.) Summerth (Large Epigeneium)

Synonyms	: <i>Dendrobium amplum</i> Lindl.; <i>Katherinea ampla</i> (Lindl.) Hawkes
Description	: Sympodial. Pseudobulbs: enclosed with many-nerves, chestnut coloured sheathing with modified leaf at base that arises from bulky branched rhizome; Leaves: elongated with round ends with notched apex; Inflorescence: one flowered being much shorter than leaves; Flower: pale greenish-brown, lavishly spotted and blotched with darker brown; Sepals tapering from a rounded base towards the apex; Petals: narrow and parallel in middle with tapering ends and pointed tip; Lip: jointed and movable, dark-purple with bronze edges; Column: narrow and wingless.
Flowering	: October-December
Habit	: Epiphytic
Habitat	: Along streams of sub-tropical to sub-temperate forests
Elevation range	: 1000-2000 m
Distribution	: India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), Bangladesh, Bhutan, China, Myanmar, Nepal, Thailand and Indo-China
Key identification	: Profusely spotted greenish brown flowers

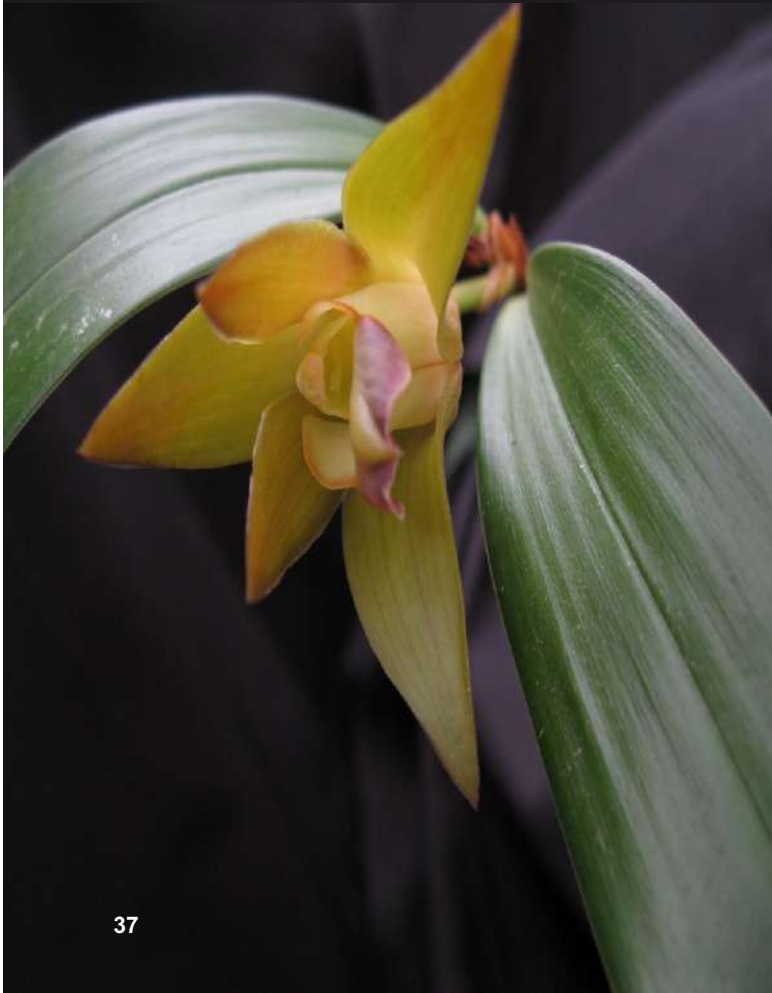
***Epigeneium fuscescens* (Griff.) Summerh.**

(Ochre-Yellow Epigeneium)

Synonyms	: <i>Dendrobium fuscescens</i> Griff.; <i>Katherinea fuscescens</i> (Griff.) Hawkes
Description	: Sympodial. Pseudobulbs: slightly curved placed apart from one another covered in chestnut sheath of 2 or 3 leaves; Leaves: leathery with short petiole elongated but blunt at each end; Inflorescence: one flowered with base covered by the sheaths; Flowers: pale purplish brown; Sepals: slightly unequal, elongated egg-shaped, gradually tapering to a sharp point; Petals: spreading with five nerves; Lip: 3 lobed, stalk less with basal lobe being roughly rectangular; Column: narrow and wingless.
Flowering	: September-November
Habit	: Epiphytic
Habitat	: Sub-tropical to temperate river valley forests
Elevation range	: 1200-2000 m
Distribution	: India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), Bangladesh, Bhutan, Nepal, China and Myanmar
Key identification	: Single flowered inflorescence, flower purplish brown



Epigeneium rotundatum (Lindl.) Summerh. (Rounded Epigeneium)



Synonyms	: <i>Dendrobium rotundatum</i> (Lindl.) Hook.f.; <i>Katherinea rotundata</i> (Lindl.) Hawkes
Description	: Sympodial. Pseudobulbs: egg-shaped with partly sheathed on a creeping rhizome; Inflorescence: one flowered and covered with sheath; Flowers: pale brown to greenish brown; Sepal are usually egg-shaped, fleshy, spreading, with nine veins; Petals are oblong, triangular at the base and tapering to a point with seven veins; Lip: three lobed, stalk less; Column: pale green, smooth, attached without a petiole and are wide at base
Flowering	: April-May
Habit	: Epiphytic
Habitat	: Sub-tropical and temperate forests
Elevation range	: 1300-2500 m
Distribution	: India (Meghalaya, Nagaland, Arunachal Pradesh, Sikkim and West Bengal) Bhutan, Nepal, China and Myanmar
Key identification	: One flowered inflorescence, petal flushed red externally

Epigeneium treutleri (Hook.f.) Ormerod

(Treutler's Epigeneium)

Synonyms	:	<i>Dendrobium treutleri</i> (Hook.f.) Schuit. & Peter B.Adams; <i>Coelogyne treutleri</i> Hook.f.
Description	:	Sympodial. Pseudobulbs: egg-shaped covered with a large sheaths becomes golden yellow when dry; Inflorescence: one flowered main stalked being enclosed in two long sheaths; Flower: purplish red; Sepals usually narrow and tapering toward the ends, pointed with nine nerves; Petals linear with five nerves; Lip: 3 lobed egg-shaped in outline, with base consisting claw; Column: narrowly winged, usually slightly curled and flexuous.
Flowering	:	September-October
Habit	:	Epiphytic
Habitat	:	Subtropical to temperate dense forests
Elevation range	:	1400-2400 m
Distribution	:	India (Assam, Arunachal Pradesh and Sikkim),China and Myanmar
Key identification	:	One flowered purplish red inflorescence





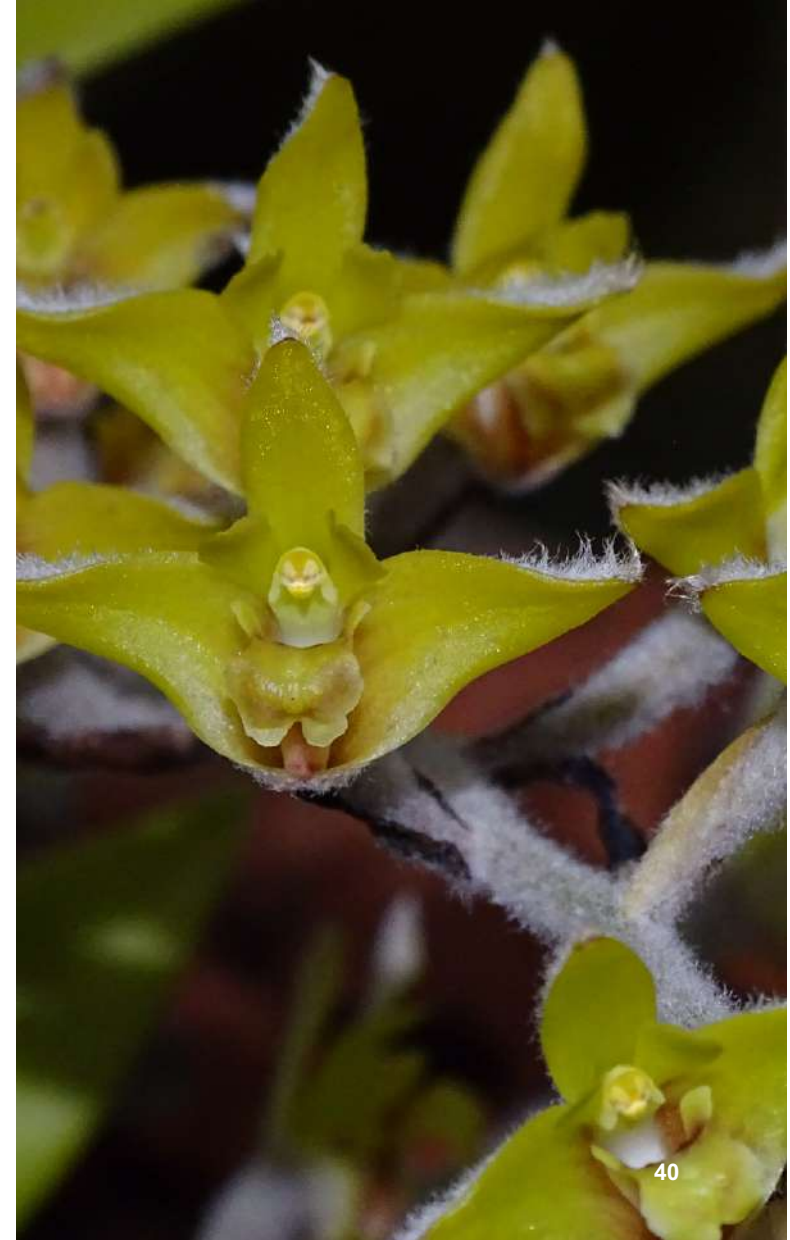
Eria coronaria (Lindl.) Rchb.f (Crowned Lip Eria)

Synonyms	:	<i>Coelogyne coronaria</i> Lindl.; <i>Eria cylindripoda</i> Griff.; <i>Trichosma suavis</i> Lindl.
Description	:	Sympodial. Pseudobulbs: narrow cylindric, slender with a single node enclosed in a large tubular sheath; Leaf: pale green with two terminal, alternate leaf arrangement; Inflorescence: 4-7 flowers arising in between leaves, erect to arching; Flowers: white flushed purple outwardly with mid lobe bright yellow; Sepal spreading, oval in shape having a tapered but not sharply pointed end; Petals egg-shaped with narrowly triangular base; Lip: 3 lobed with lateral lobes dark purple streaks and mid lobes bright yellow; Column: 5-6 mm long.
Flowering	:	October-December
Habit	:	Epiphyte
Habitat	:	Subtropical to temperate forests
Elevation range	:	1400-2500 m
Distribution	:	India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim, West Bengal and Uttarakhand), Bhutan, China, Myanmar, Thailand, Nepal and Indo-China
Key identification	:	White flower with purple lip and bright yellow mid lobe

Eria lasiopetala (Willd.) Ormerod

(Shaggy petaled Eria)

Synonyms	:	<i>Aerides lasiopetala</i> Willd.; <i>Eria flava</i> Lindl.: <i>Eria pubscens</i> (Hook.) Lindl.
Description	:	Sympodial. Pseudobulbs: oblong with regular rounded ends, enclosed in skin-tight translucent many nerved sheaths; Leaves: elongate but blunt at each end with slanted tip, sharply pointed with eight-nerves, tapering towards petiolated base; Inflorescence: a raceme, from the base of pseudo-bulb, erect, sturdy, covered with dense white soft matted woolly hair; Flowers: green to yellow covered with dense epidermal hair; Sepals Yellowish, densely white or grayish cottony hairs in the lower surface; Petals narrowly rounded at the ends, glabrous, lying parallel over the column; Lip: oblong, 3-lobed; Column: erect, right angle to the foot.
Flowering	:	April-June
Habit	:	Epiphytic
Habitat	:	Tropical to subtropical forests
Elevation range	:	400-1700 m
Distribution	:	India (Assam, Manipur, Meghalaya, Mizoram, Arunachal Pradesh, Sikkim, West Bengal, Uttarakhand, Odisha, Bihar and Chhattisgarh), Bangladesh, Bhutan, China, Myanmar, Nepal, Thailand and Indo-China
Key identification	:	Green to yellow coloured flower. Petals lie parallel over the column





Gastrochilus calceloris (Buch.-Ham. ex Sm.) D. Don

(Shoe shaped belly lip orchid)

- Synonyms : *Aerides calceolaris* Buch.-Ham. ex Smith;
Saccolabium calceolare (Buch.-Ham. ex Smith) Lindley.
- Description : **Monopodial. Stem:** hanging freely; **Leaves:** strongly sickle-shaped, narrow and parallel-sided in the middle with widened base and tapered tip; **Inflorescence:** many flowered borne from upper part of stem being shorter than leaves; **Flowers:** fragrant, fleshy, widely opening; Sepals and Petals are pale yellow with reddish brown blotch in inner and outer part; **Lip:** semi circular without a petiole, consist of finely toothed margin with hairy disc; **Colum:** long, flushed purple.
- Flowering : April-May or September- December
- Habit : Epiphyte
- Habitat : Subtropical to temperate forests
- Elevation range : 1000-2500 m
- Distribution : India (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Arunachal Pradesh, Sikkim, West Bengal, Himachal Pradesh, Uttarakhand, Andhra Pradesh and Andaman & Nicobar Islands), Bangladesh, Bhutan, China, Nepal, Myanmar, Malaysia, Thailand and Indo-China
- Key identification : Small pale yellow flowers with reddish brown blotch

Liparis bistriata C.S.P.Parish & Rchb.f.

(Two-striped Liparis)

Synonyms	:	<i>Liparis bistriata</i> var. <i>robusta</i> Hook.f.; <i>Liparis saltucola</i> Kerr
Description	:	Sympodial. Pseudobulbs: densely arranged, elongated and stem like; Inflorescence: peduncle somewhat circular bearing more than 20 flowers; Flowers: pale green; Sepals: nearly oblong consisting 3-veines, margins rolled outward over lower surface; Petals: linear consisting 1-veines; Lip: base expanded and thick with upper part carrying narrow wings; Column: curved, hollow below the apex and broad in the base.
Flowering	:	July-August
Habit	:	Epiphytic
Habitat	:	Sub-tropical forests
Elevation range	:	800-1800 m
Distribution	:	India (Assam Manipur, Meghalaya, Nagaland, Sikkim, Arunachal Pradesh and West Bengal), China, Myanmar and Thailand
Key identification	:	Pendulous inflorescence with more than 20 pale green flowers





Liparis resupinata Ridl. (Resupinate Liparis)

- Synonyms : *Liparis resupinata* var *ridleyi* King & Pantl.; *Liparis ridleyi* Hook.f.
- Description : **Sympodial. Pseudobulbs:** clustered, nearly cylindrical consisting 3-4 remote leaves; **Leaves:** papery textured, elongated with blunt ends to widened at the base and tapering to the apex, margin slightly saw-toothed; **Inflorescence:** stalk arching or hanging bearing 10-50 flowers; **Flowers:** pale green or greenish yellow; Sepals pointed, oblong with regular rounded ends; Petals narrowly linear; **Lip:** oblong with regular broad rounded ends, both sides strongly contracted with two lateral splits; **Column:** erect.
- Flowering : October-December
- Habit : Epiphytic
- Habitat : Subtropical and temperate broadleaved forests
- Elevation range : 1300-2500 m
- Distribution : India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim, West Bengal and Uttarakhand), Bangladesh, Bhutan, China, Nepal, Thailand and Indo-China
- Key identification : Long inflorescence with pale green flowers

***Oberonia falcata* King & Pantl.**

(Sickle leaf Oberonia)

Synonyms	:	<i>Oberonia pendula</i> Ridl.; <i>Oberonia caudata</i> King & Pantl
Description	:	Sympodial. Stem: smooth pale-green, flattened laterally, enveloped in closed leaf sheaths; Leaves: sickle-shaped, having sharp edges and tapering to a slender point, pointed or slightly needle shaped; Inflorescence: erect or slightly erect, with many short stalked flowers; Flowers: yellowish-green with smooth texture; Sepals smooth, egg-shaped, pointed or bluntly pointed; Lip: orange yellow, broadly elongated with blunt ends in outline flat except for a slight depression near its base; Column: green, very short with two sharp wings.
Flowering	:	June-August
Habit	:	Epiphyte
Habitat	:	Subtropical to temperate forest and river valley
Elevation range	:	1300-2500 m
Distribution	:	India (Meghalaya, Arunachal Pradesh, Sikkim and West Bengal), Nepal, Indonesia, Thailand, Malaysia and Indo-China
Key identification	:	Minute, numerous pale green flowers





Otochilus albus Lindl.

(White Otochilus)

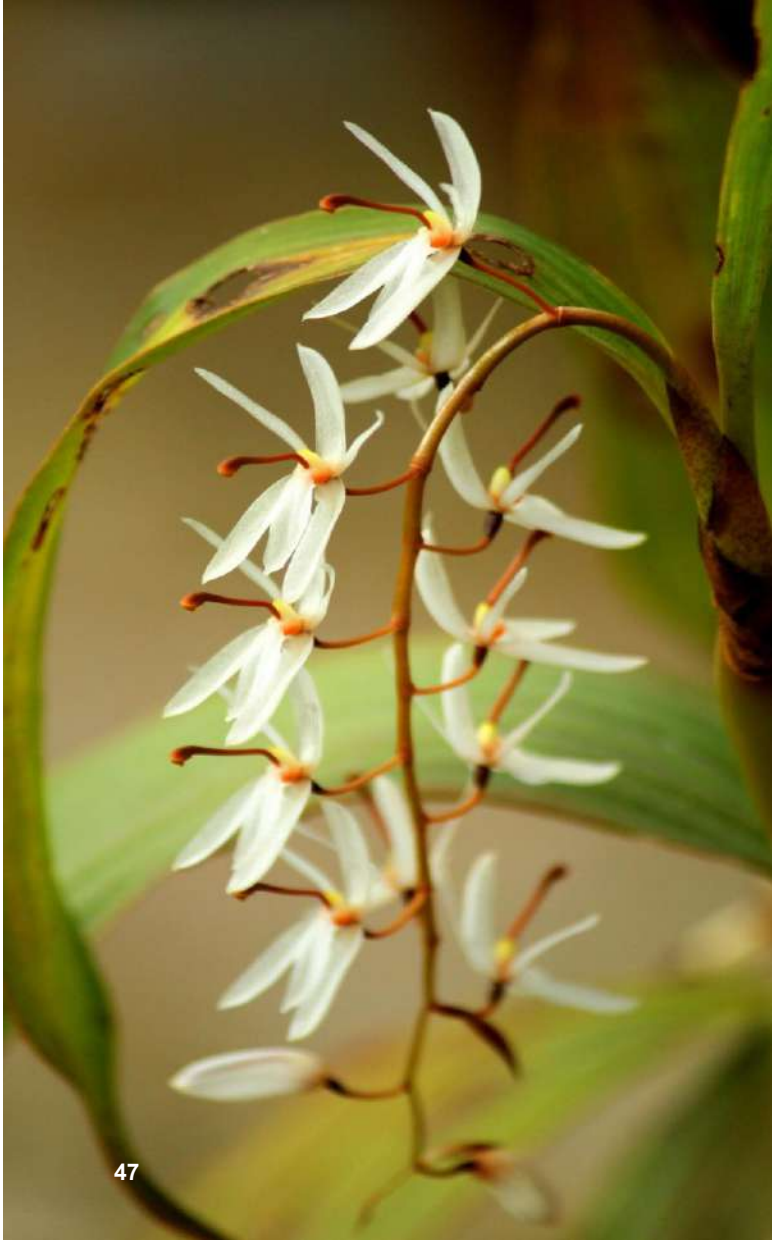
Synonyms	:	<i>Coelogyne alba</i> (Lindl.) Rcbh.f.; <i>Broughtonia pendula</i> Wall. ex Hook.f.
Description	:	Sympodial. Pseudobulbs: enclosed in tubular sheaths when young, brownish yellow when dried; Leaves: narrowly elongated with blunt or rounded ends; Inflorescence: nearly erect, hanging weakly zigzag, bearing 8 or 9 flowers; Flowers: white with yellowish brown band at the middle of lip; Sepals white, 3-veined nearly equal, elongated with blunt ends to tapering to a point at the apex or base; Petals 3-veined narrowly elongated with round base and tapered apex; Lip: 3-lobed with rather broad side lobes embracing column; Column: elongated with blunt ends, slightly winged and thicken towards apex.
Flowering	:	June-July
Habit	:	Epiphytic
Habitat	:	Moist subtropical forest
Elevation range	:	1300-1500 m
Distribution	:	India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), China, Myanmar, Nepal, Thailand and Indo-China
Key identification	:	Pseudobulb with roots at joint. Flower uniformly white

Otochilus fuscus Lindl.

(Dusky Otochilus)

Synonyms	:	<i>Coelogyne fusca</i> (Lindl.) Rchb.f.; <i>Broughtonia fusca</i> (Lindl.) Wall. ex Hook.f.
Description	:	Sympodial. Pseudobulbs: hanging, covered with fibrous sheath, greenish yellow or slightly tinged with brown when dry; Leaves: needle shaped, narrow and parallel-sided in the middle, with widened base and tapered apex acuminate; Inflorescence: stalk nearly erect, rachis bearing ten to many flowers; Flowers: fragrant, white or tinged yellow; Sepals elongated with blunt ends or nearly narrow consisting 5-veined; Petals 3-5 veined, mid vein slightly thickened; Lip: 3 lobed, translucent white, with a short brownish-pink pouch; Column: slightly winged in the upper part with no foot.
Flowering	:	March
Habit	:	Epiphyte
Habitat	:	Subtropical forest slopes in old tree trunk
Elevation range	:	1200-2100 m
Distribution	:	India (Sikkim, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland and West Bengal), Bhutan, China, Nepal, Myanmar, Thailand and Indo-China
Key identification	:	Fragrant flowers white or tinged yellow. Greenish yellow pseudobulb





***Otochilus lancilabius* Seidenf.**

(Lanceolate Lip Otochilus)

- Synonyms : *Otochilus albus* var. *lancilabius* (Seidenf.) Pradhan
- Description : **Sympodial. Pseudobulbs:** broadest in middle and tapering to each end with few roots borne at joints; **Leaves:** narrowly elongated with rounded ends consisting many nerves, slender towards petiolated base; **Inflorescence:** hanging from apical part or pseudobulb slightly below the base of leaves; **Flowers:** white and smooth devoid of epidermal hairs; **Sepals:** white nearly equal, narrowly elongated with blunt ends with pointed tip; **Petals:** white, linear, with pointed tip; **Lip:** turned downward from the short and rounded base, elongated with blunt ends to oval; **Column:** narrow, upper part winged and thickened.
- Flowering : October-January
- Habit : Epiphyte
- Habitat : Evergreen oak forests
- Elevation range : 1500-2800 m
- Distribution : India (Sikkim, Arunachal Pradesh, Nagaland, West Bengal and Uttarakhand), Bhutan, China, Nepal and Indo-China
- Key identification : White flowers, Slightly wrinkled pseudobulb

Pholidota articulata Lindl.

(Articulated Pholidota)

Synonyms	: <i>Coelogyne articulata</i> (Lindl.) Rchb.f.; <i>Coelogyne khasyana</i> (Rchb.f.) Rchb.f.
Description	: Sympodial. Pseudobulbs: connected to each other at both ends and are stem like; Leaves: two at the apex of new pseudobulb; Inflorescence: at the apex of new pseudobulb bearing ten or more flowers; Flowers: white with slight reddish tinge; Sepals elongated with blunt ends or with rounded ends carrying 5-veined; Petals elongated with blunt ends and tapered apex carrying 5-veined; Lip: broadly elongated with blunt ends, middle lobe infolded at its base, the disc with 5-orange-yellow lamellae; Column: hard with apex winged.
Flowering	: July-August
Habit	: Epiphytic and lithophytic in shaded rocks
Habitat	: Tropical and subtropical forest
Elevation range	: 700-1800 m
Distribution	: India (Sikkim, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, West Bengal, Himachal Pradesh and Uttarakhand), Bhutan, China, Myanmar, Indonesia, Malaysia, Nepal, Thailand and Indo-China
Key identification	: Brownish pink flowers, pendulous inflorescence



Pholidota pallida Lindl.

(Pale Pholidota)

Synonyms : *Coelogyne pallida* (Lindl.) Rchb.f.; *Coelogyne calceata* Rchb.f.

Description : **Sympodial. Pseudobulbs:** ovoid to conical with broad base, slightly wrinkled, greyish green, partially enclosed in fibrous sheaths from the base; **Leaf:** solitary, elongated with rounded ends to being widest at the apex or tapering to both ends, nearly pointed and thick, dark-green above and grayish-green; **Inflorescence:** slightly hanging from the base of the pseudobulb; **Flowers:** white slightly tinged with reddish pedicel. Sepals white, nearly equal, not spreading; Petals narrowly oblong with long slender base, slightly curved, bluntly pointed with single-nerve, translucent white; **Lip:** semi-round, 3-lobed, deeply short and round at the base, carrying 3-longitudinal lamellae; **Column:** white, broad and winged in its middle or lower half.

Flowering : May-August

Habit : Epiphytic

Habitat : Cool mixed subtropical and temperate forests

Elevation range : 800-2700 m

Distribution : India (Assam, Meghalaya, Nagaland, Sikkim, Arunachal Pradesh,, Manipur, West Bengal, Andhra Pradesh and Jharkhand), Bhutan, China, Nepal, Myanmar, Thailand and Indo-China

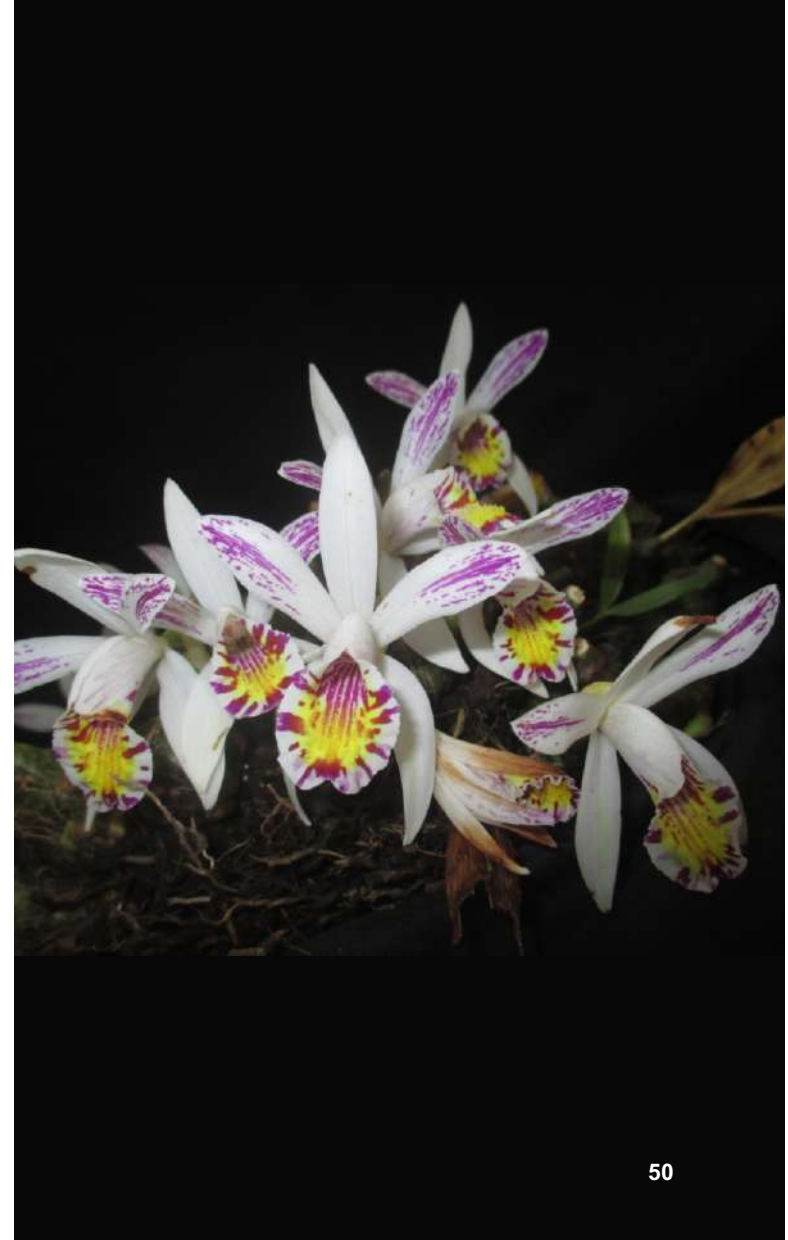
Key identification : White flowers with slightly tinged with red pedicel



Pleione maculata (Lindl.) Lindl. & Paxton

(Spotted Pleione)

Synonyms	:	<i>Coelogyne maculata</i> Lindl.; <i>Pleione diphylla</i> Lindl. & Paxton
Description	:	Sympodial. Pseudobulbs: barrel shaped, green with purplish-brown, enveloped in fibrous nets; Leaves: narrowly elongated with rounded base, pointed and narrowed towards short petiolated base; Inflorescence: appearing after leaves have fallen, erect; Flower: nearly erect, white streaked with reddish-purple; Sepals pure white, nearly equal and pointed, narrowly elongated with rounded base, 5-nerved; Petals white with purple shade towards the tip, inversely lanceolate with widest apex, nearly pointed, 5-nerved; Lip: white marked with purple and yellow broadly elongated with rounded ends, 3-lobed; Column: pure white, slightly curved, irregularly notched winged apex with 2-purple bands in front.
Flowering	:	October-November.
Habit	:	Epiphytic
Habitat	:	Sub-tropical forest.
Elevation range	:	700-1500 m
Distribution	:	India (Assam, Manipur, Mizoram, Nagaland, Meghalaya, Arunachal Pradesh, Sikkim and West Bengal), Bhutan, China, Nepal, Myanmar and Thailand
Key identification	:	Flowers one per short stem, white flowers with bright yellow and purple blotches





***Pleione praecox* (Sm.) D.Don** (Early blooming Pleione)

Synonyms	:	<i>Epidendrum praecox</i> Sm.; <i>Coelogyne praecox</i> (Sm.) Lindl.
Description	:	Sympodial. Pseudobulbs: barrel shaped, green blotch with purplish-brown, enclosed in ragged fibrous sheaths; Leaves: two or rarely one, oblong with rounded ends to broad apex; Inflorescence: erect, arising from the base of pseudobulb; Flowers: solitary or rarely two, white flushed with purple; Sepals nearly equal, expanding, pointed with wide apex, 7-nerved, spreading; Petals pointed, spreading, narrow and parallel-sided in the middle with widened base and tapered apex, 5-nerved, purple; Lip: shaped like an egg, whitish-purple, 3-lobed; Column: with a short sac at the base, the apex expanded into a wide irregular hood, pure white.
Flowering	:	October-November
Habit	:	Epiphytic or Lithophytic
Habitat	:	Sub-tropical to temperate forests
Elevation range	:	1200-3000 m
Distribution	:	India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim, West Bengal and Uttarakhand), Bhutan, China, Myanmar, Nepal and Thailand
Key identification	:	Solitary flower, flower bloom after leaves wither

Thunia alba* (Lindl.) Rchb.f. var. *alba (White Thunia)

- Description : **Sympodial. Stem:** tube like, smooth, erect and clustered, base with several sheaths completely clasping the stem; **Leaves:** narrowly oblong with rounded ends to tapering apex without a petiole, covered with smooth waxy coating beneath; **Inflorescence:** terminal drooping; **Flowers:** large, white, lip yellow [or white] and with orange or chestnut spots and stripes; Sepals white, nearly equal and elongated with blunt ends, pointed with only opening at the mouth; Petals similar to sepals in size, slightly narrower; **Lip:** broadly oval to elongated with blunt ends with broadly irregularly notched with apical margin crisped; **Column:** expanded and winged at the apex.
- Flowering : June-August
- Habit : Epiphytic
- Habitat : Sub-tropical forests.
- Elevation range : 600-2000 m
- Distribution : India (Manipur, Mizoram, Nagaland, Sikkim, West Bengal, Uttarakhand and Andaman & Nicobar Islands), China, Bhutan, Malaysia, Myanmar, Nepal, Thailand and Indo-China
- Key identification : Thin papery leaves, flowers white





Uncifera obtusifolia Lindl.

(Rounded leaf Uncifera)

Synonyms	:	<i>Uncifera heteroglossa</i> Rchb.f.; <i>Saccolabium obtusifolium</i> (Lindl.) Hook.f.
Description	:	Monopodial. Stem: loosely hanging, branched, covered with leaf sheaths; Leaves: flat, nearly rectangular with many-nerves, slightly tapered to the blunt bi-lobed tip and basal covering sheaths; Inflorescence: short and robust from below the leaves or opposite to it. Flowers: greenish-yellow to pale yellow; Sepals nearly unequal, greenish-yellow to yellow, with rounded tip; Petals unequal, slightly circular, margin uneven, translucent yellow to greenish yellow; Lip: continues with a large wide mouthed funnel shaped sac; Column: slightly winged, wing fleshly and bi-lobed
Flowering	:	July-October
Habit	:	Epiphytic
Habitat	:	Sub-tropical forests.
Elevation range	:	900-1400 m
Distribution	:	India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Sikkim and West Bengal), Bhutan and Nepal
Key identification	:	Flowers greenish-yellow to pale yellow

Vanda cristata Wall. ex Lindl.

(Comb trudelina)

Synonyms	: <i>Trudelia cristata</i> (Lindl.) Senghas ex Roeth.
Description	: Monopodial. Stem: stout, branched and erect, upper half covered with sheathing leaves; Leaves: many thick and rigid leaf are narrowly elongated and folded along the length, unequally bilobed or tri-lobed at the tip; Inflorescence: 1-4 singly stalked flowers are erect; Flowers: pale olive green or yellowish with lip boldly blotched with dull purplish-brown; Sepals nearly unequal, not fully spreading, pale green or pale olive green, slightly thickened at the tip; Petals are nearly rectangular with slightly pointed tip, slightly thickened at the apex, pale green; Lip: joined to the base of column, 3-lobed, ending in a deep funnel shaped spur at the base; Column: cream-white.
Flowering	: May-July
Habit	: Epiphytic
Habitat	: Sub-tropical and temperate forests
Elevation range	: 1000-2000 m
Distribution	: India (Manipur, Meghalaya, Mizoram, Nagaland, Arunachal, Sikkim, Uttarakhand, West Bengal and Himachal Pradesh), Bangladesh, Bhutan, Nepal, China, Myanmar and Indo-china
Key identification	: Large lip has 2 horn-like structures at the apex giving the appearance of a tongue





Way Forward

Orchids are exquisitely vibrant and ecologically vital element of biodiversity. The economic value of the orchids as cut flowers that run into multibillion-dollar in the international trade is well known. The rise in this aspect in recent decade has been tremendous. The ecological role of orchids in the ecosystem has not drawn the attention, which it deserves and is often undermined. Orchids, known to be highly advanced plants, developing various contrivances to attract pollinators, and are the indicators of the health of the ecosystem. India, with its orchid wealth of 1,256 species, has tremendous potential to make an impact in the international scenario of trade, and at the same time focus on conservation issues. The need for orchid conservation is paramount so as to leave to future generations the rich and wildly fascinating orchid legacy we all enjoy today.

Due to their complex life histories, orchids are liable to be severely affected by habitat destruction and climate change, and unsustainable harvest presents a major additional risk to some groups of orchids. To conserve orchids effectively, there is need to understand their biology, conserve habitat especially for orchid-rich environments, conservation planning for groups of species (e.g. those that are closely related, affected by similar threats or growing sympatrically) and ensuring sustainable harvesting.

As conservation of wild orchid species in their natural habitat is now a matter of universal concern as orchids are very sensitive to ecological disturbances. The Nature Learning Centre aims to conserve the orchid species and promote the conservation knowledge and importance of biodiversity in general and orchids of Sikkim in particular, through the creation of trails. Development of orchid trails can be very helpful in conservation of orchids, both *in-situ* or *ex-situ* depending on the availability of orchid species in the area or rescue and collection from other sites. The concept of the trail can be replicated at various other places like schools, colleges, offices and other institutions or by individuals at their home. The trail developed at GBPNIHE, SRC will encourage the diverse stakeholders, specially the school and college students, scholars tourists, officials and local communities to visit and learn more on orchid diversity and conservation.

This booklet serves to fulfill the purpose of knowledge dissemination by highlighting the rich orchid diversity of the State and enhance ex-situ conservation to strengthen the orchid diversity present in this area. Assuredly, this thoughtfully crafted booklet will serve as the need of an hour to facilitate knowledge networking on Orchid conservation amongst researchers, academicians, departments, nature conservationists and enthusiast. The pictorial representation of the orchids will make the understanding of the orchids in the trail more relevant for the visitors and students. Perhaps, to bring about a relational understanding of orchids with the nature and human itself, this booklet is tailored with utmost consideration and simplicity.

Further Reading

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About the GBPNIHE

GB Pant National Institute of Himalayan Environment (NIHE) was stabilized in 1988 to devise suitable R&D strategies to maintain intricate balance between socio-cultural, ecological, economic and physical systems that could lead to enhance quality of life and ecological sustainability of the ecosystem. The Institute carried out in-depth research into most of these priority areas, with keeping a sharp focus on its societal linkages. The Institute has emerged as focal agency to advance scientific knowledge; to evolve integrated management strategies; demonstrate their efficacy for the conservation of natural resources; and to ensure environmentally sound development in the entire Indian Himalayan Region (IHR). The Planning Commission, the Ministry of Environment & Forests, Government of India and many International Organizations have recognized the Institute as a Nodal Agencies for R&D programmes in IHR.

The mandate of the Institute:

Undertake in-depth research and development studies on environmental problems of the Indian Himalayan Region.

Identify and strengthen the local knowledge of the environment and contribute towards strengthening research of regional relevance in the scientific institutions, Universities/ NGOs/ Voluntary agencies working in the Himalayan region, through interactive networking.

Evolve and demonstrate suitable technology packages and delivery systems for sustainable development of the region, in harmony with local perceptions.



About the Sikkim Regional Centre (SRC)

The Sikkim Regional Centre (SRC) was established in Gangtok, Sikkim in the year 1989. In the year 2004, a campus covering a land area of 17 acres made functional at Pangthang (2000 m, asl), at a distance of about 15 Km from Gangtok facing the mighty Mt. Khangchendzonga, having with the main office building, laboratories, a gamut of nurseries, herbal garden, functional arboretum, residential quarters, rural technology centre, etc. The functional arboretum (10 acres area) houses over 100 native tree species, besides numerous shrubs and herbs, bamboo groves, rhododendron's conservatory, medicinal plants and multi-purpose tree habitat zones, with over 100 inhabiting and visiting birds and small mammals. The broad focal area of SRC covers Biodiversity Conservation and Management and Biotechnology Applications, Sustainable Environmental Development, Knowledge Base Development, and Capacity Building, Climate Change Studies, Ecosystem Services, etc. SRC of the Institute has been taking up activities with research and development on the environment and development in Sikkim state and hilly region of West Bengal (Darjeeling and Kalimpong districts including foothill parts of Alipurduar and Jalpaiguri districts). Over the years, this centre has brought-out several knowledge products as peer reviewed papers in reputed scientific journals, popular articles, books/booklets, and technical reports. The centre is now attempting to build a strong-network of partners for delivering R&D products that serve policy and planning process in the state of Sikkim.



A wide-angle photograph of a snow-covered mountain range. The peaks are jagged and covered in white snow, contrasting sharply with the clear, deep blue sky. The foreground shows the dark, silhouetted ridges of the mountains, creating a sense of depth and scale.

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