



beautiful **ORCHIDS**

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Introduction : Scientific Classification



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- Kingdom : Plantae
 - Division : Magnoliophyta
 - Class : Liliopsida
 - Order : Asparagales
 - Family : Orchidaceae
 - Group : Bizarre
-
- Subfamily/Tribe/Subtribe/Alliance/Genus/Species are different from one to another.
 - One Genus having so many species.



Introduction : General



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- Orchids get their name from the Greek Orchis meaning "testicle"
- The word "Orchis" was first used by Theophrastus (372/371–287/286 B.C.) in his book "De historia plan tarun" (The natural history of plants) is considered the father of botany and ecology.
- Orchids are cosmopolitan in distribution. Occurring in every habitat, except Antarctica and deserts.
- The great majority are to be found in the tropics, most Asia, South America and Central America. They are found above the Artic Circle in Southern Patagonia and even on Macquarie Island, close to Antarctica,
- About 800 to 1000 new species are added each year.
- All Orchid species are protected for the purposes of international commerce under CITES (Convention on International Trade in Endangered Species) as potentially threatened or endangered in their natural habitat except hybrids.



Introduction : General



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- Orchids, the most beautiful flower
- Over 800 described genera and 25,000 – 35,000 species (exact number is unknown since classification differs).
- Orchid exhibit an incredible range of diversity in Size, Shape and Colour.
- Occupy top position among all the flowering plant.
- Valued for cut flower production and as potted plants.
- Known for their longer lasting and bewitchingly beautiful flowers.



Introduction : General



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- Orchids are truly flowers of superlatives. Even a complete layman in botany is awed by the beauty of orchids.
- No plant family has as many different flowers as the Orchid family.
- Most African Orchids are white, while Asian Orchids are often multi colored.
- Some Orchids only grow one flower on each stem, others sometimes more than a hundred together on a single spike.
- Mexican Laelics and Indian dendrobiums, cymbidiums and vandas have played a major role in the development of modern Orchid industry in the world.

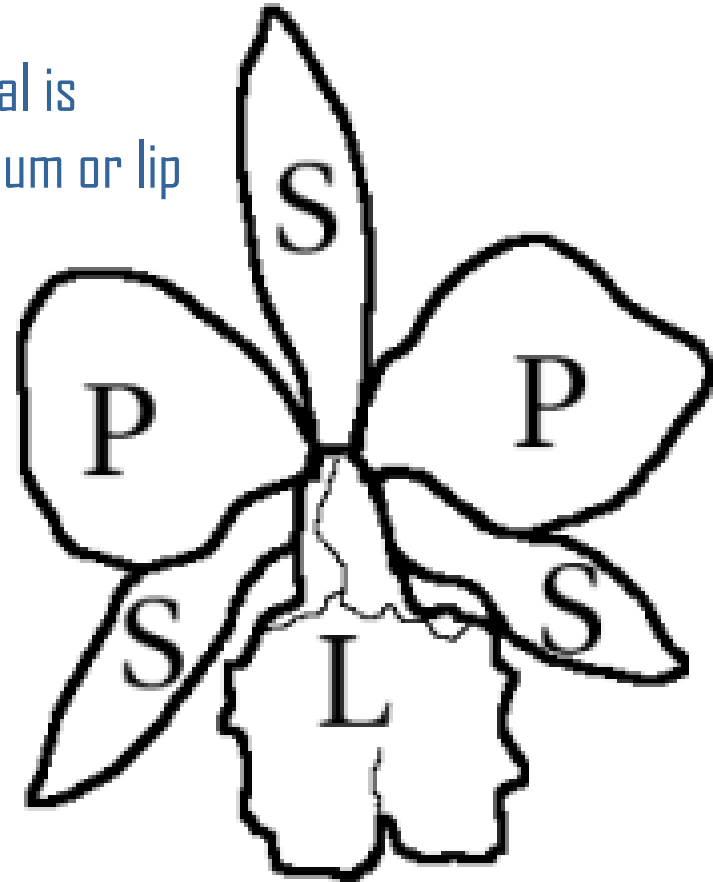


Introduction : Features



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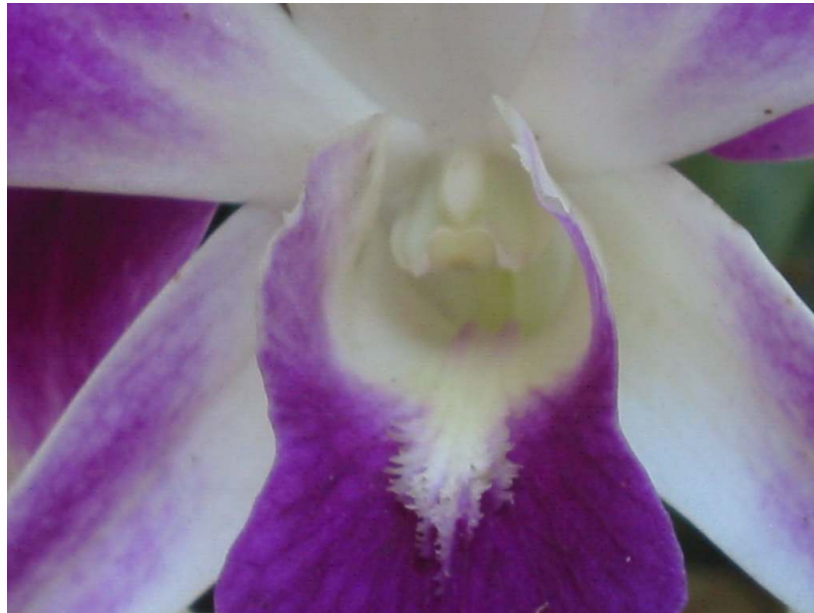
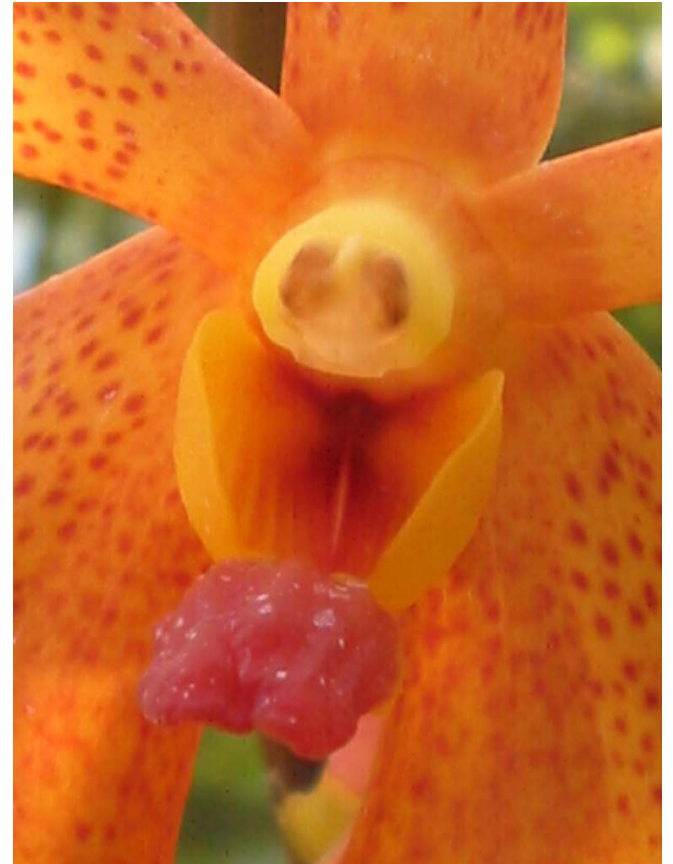
- The basic orchid flower is composed of
 - Three sepals in the outer whorl
 - Three petals in the inner whorl
 - However one of the petals, the medial petal is different from the others and is called labellum or lip



Introduction : Features



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Introduction : Features



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Most advanced Orchids have five basic features

1. The presence of a column : call gynostemium.
2. The flower is bilaterally symmetric
3. The pollen are glued together into the pollinica, a mass of waxy pollen on filament.
4. The seeds are microscopically small (exception Disa & Vanilla)
5. The seeds can, under natural circumstances, only germinate in symbiosis with specialized fungi.

Introduction : Distribution



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Tropical America	:	300 – 35 Genera
Tropical Asia	:	210 – 300 Genera
Oceania	:	10 – 70 Genera
Eurasia	:	40 – 60 Genera
North America	:	20 – 30 Genera

Introduction : Grouping



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Orchid can be divided into two basic growth types

Monopodial (one footed)

(Eg. Phalaenopsis, Renonthera, Vanda, etc.

have a main stem which continues to grow year after.



Sympodial (many footed)

(Eg. Cattleya, Cymbidium)

The Plant produces a series of adjacement shoots which grow to a certain size, bloom, then stop growing to be replaced by the next growth..

Introduction : Grouping



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Orchids can be divided into four types according to growing condition

1. Epiphytes - Air Plants, which grow on trees
2. Lithophytes - The rock growers, cling to the surfaces of rocks.
3. Saprophytes - Those that grow in mulch, often on the forest floor,
4. Terrestrials - Which anchor themselves in soil or sand.

As most Orchids are epiphytes, they can be grown in tree bark, crumbled charcoal, pebbles or on wooden or cork plaques





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Types of Orchid : Dendrobium



Types of Orchid : Vanda



Types of Orchid : Phalaenopsis



Taisuco



Naple Nights



Cornu_Cervi



White



Pink

Types of Orchid : Oncidium



ONCIDIUM INCURVUM BSA. var. FL. ALBO

(Cultiv. F. de Passandun)

(J. Lindley, post.)

Types of Orchid : Miltonia



Boonchoo



Pupukea_Sunset



Schomnugkia_Tibicinis

Types of Orchid : Cattleya



Types of Orchid : Phaius



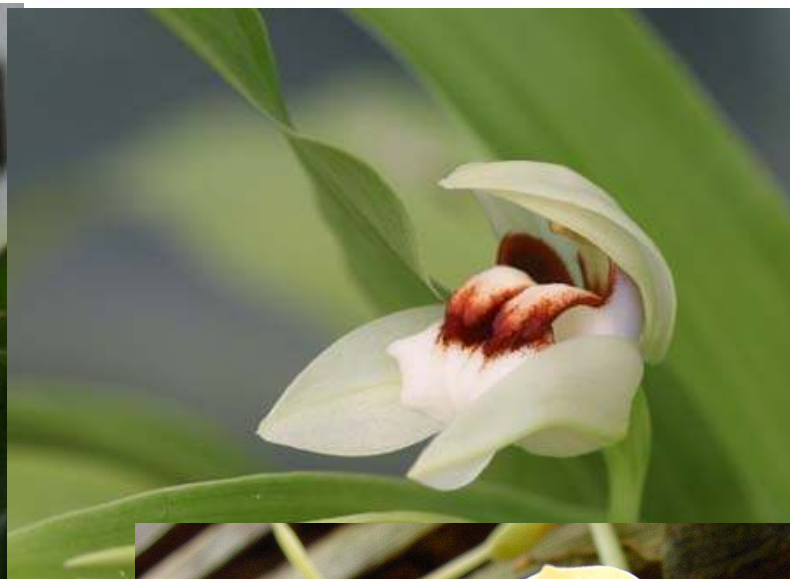
Types of Orchid : Bulbophyllum



Types of Orchid : Cymbidium



Types of Orchid : Coelogyne



Types of Orchid : Renanthera



Types of Orchid : Paphiopedilum



Types of Orchid : Mexipedium



Types of Orchid : Phragmipedium



Types of Orchid : Cyripedium



How to Care Orchids : General



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- Indirect sunlight is ideal for Orchid
- Seedlings requires less sunlight than adult plant.
- Very poor light tends to produce weak plants and retards flowering
- Optimum requirement varies between species to species
- *Cypropedium* and *Phalaenopsis* required only 200 – 300 foot candles.
- *Vanda* & *Aranda* best under 800 foot candles
- Growers have used shadenets in 35% to 85% shade percentage to grow Orchids of different genera.



How to Care Orchid : Orchid House



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- Orchids in nature grow pretreated from the tropical sun by the shades of trees.
- Under controlled conditions the Orchids can be grown in Orchid house.
- Running North to South and made from materials like split bamboo, glass, shade nets etc.
- Central trunk filled with water or by using artificial fogging nozzles helps in increasing humidity.
- All types of Orchids cannot be grown under one roof.
- Tropical Orchid enjoy humid, warm atmosphere.
- Temperate Orchid should be growing in cool houses.
- Proper ventilation is must to provide fresh air.
- Orchids dislikes sudden change in temperature., the best suitable range is 18 °C to 30 °C
- However Orchids likes Vanda, Aranda, Arachnis, Renanthera, Kegawara, Mokara can be grown in open sun. in trenches filled with brick pieces and characoal.

How to Care for Orchids : Summary



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Genus	Light	Temperature	Water	Humidity
Phalaenopsis	Grow & bloom well in a bright window or a room with little or no sun	Warmer Condition	Watering very important. No water storage capacity	15.6 to 26.7%
Vanda	High light conditions	15.6 ^o to 24 ^o C at night 29.4 ^o to 35 ^o C Day	Should be given frequently	21.1 to 26.7%
Oncidium	less light (indoor)	15.6 ^o – 18.3 ^o C at night 26.7 ^o to 32.2 ^o C day	Watering thoroughly and allow to dry	40 to 15.6%
Miltonia	High light Condition	10 ^o – 18.3 ^o C night 24 ^o – 29.4 ^o C day	Heavily during growing period	15.6 to 21.1%
Cattleya	Bright Light	10 ^o – 12.8 ^o C night 21.1 ^o – 37.8 ^o C day	Need dry out thought between watering	15.6%
Dendrobium	Bright Light	15.6 ^o – 18.3 ^o C night 26.7 ^o – 37.8 ^o C day	Need moist when they are young	15.6%
Phaius	Less Light	10 ^o – 35 ^o C day	Evenly moist at all time	15.6%
Bulbophyllum	Low – Light required	10 ^o – 35 ^o C day	Grow well with watering twice a day.	15.6%

How to Manure



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- In nature, Orchids obtain their supply of inorganic nutrients like calcium, Magnesium, Iron, Potassium, Nitrogen and traces of manganese, boron, copper, zinc etc. from the tree on which they are growing and also from atmosphere and decaying vegetables and dropping of birds,
- Under control conditions they have to be supplied these major and minor nutrients.
- Solid and liquid fertilizer mixtures are available in the Market.
- Liquid fertilizers are much more quickly absorbed and can be applied more frequently.
- Usage of fertilizer depend on stage of growth.
- During vegetative growth, large quantities of nitrogen are required while during flowering, nitrogen should be reduced and amount of phosphate increased.
- NPK 20:20:20 or 18:18:18 is good during vegetative growth.
- NPK 10:20:30 or 7:12:40 is good during flowering stage.
- In general, PH of the nutrient solution should be slightly acidic or neutral but not alkaline.
- Fertilizer should be made on sunny days during 8.00 a.m. – 10.30 am. for better absorption.

How to Propagate Orchid : General



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- Orchids like other Horticultural crops may be propagated either sexually or Asexually.
- Since most of the commercial Orchids are highly heterozygous they are not raised through seed and are propagated through vegetative means to get true to type plants.

How to Propagate Orchid : Methods



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- Cutting
- Off shoots and keikis
- Aerial shorts
- Seed
- Tissue Culture

How to Propagate Orchid : Cutting



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- Orchid like Aerides, Arachnic, Epidendrum, Renanthera, Phalaenopsis, Vanda and Dendrobium can be propagated by cutting.
- Cut ends should be treated with fungicides to prevent rotting.
- most of the sympodial Orchids like Ceeelogyne, Catteleya, Dendrobium and Cymbidiun are propagated through this method.

How to Propagate Orchid : Off shoots and Keikis



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- Same monopodium Orchids like Ascocenda, and Phalaennopsis, Keikis or off shoots emerge frequently on the main stem.
- Induction of Keikis can also be induced through the use of cytokinins which force the dormant bud to develop into keikis.

How to Propagate Orchid : Aerial Shoots



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- Most of the dendrobium produce Aerial shoots or bulbs on old back bulbs devoid of leaves. Usually arise on the upper part of the back bulbs.

In genera like Good year, Rhizomes gives off special lateral branches which turn up and produce aerial shoots.



How to Propagate Orchid : Seed



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- Orchids produce seed pods with literally hundreds of thousands of seed that are released and scattered by the wind. (1,300 to 400,000)
- Colour may be white, Cream, Pale green, reddish orange or dark brown and have very diverse shapes.
- Orchid seeds must establish a symbiotic relationship with a special fungus to survive its first year of life.
- The fungi gathers water and minerals for itself and the seedling, and the seedling shares its sugars from photosynthesis with the fungus.
- Only one or two orchid seeds will ever germinate and survive on that perfect crevice or depression that is both moist and has the fungus present.
- Its chances to survive in the wild long enough to bloom are slim.



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How to Propagate Orchid : Seed



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- To avoid this problem, greenhouse growers sow orchid seeds on moist, sugar-rich, sterile agar, or they cut out growing clumps of orchid cells and place them on the agar.
- These techniques allow many hundreds of orchid plants to survive to maturity.
- New and improved hybrids can be mass produced rapidly.
- This is important as orchids are very slow growing as many orchids take five to seven years to mature to flowering.
- Breeding three or four orchid generations could span a person's lifetime just to get one new hybrid propagated sufficiently for sale.



How to Propagate Orchid : Tissue Culture



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- Tissue culture technique were applied to orchids in 1960.
- Tissue culture technique is highly successful to get virus free plants.
- Today tissue culture is preferred for commercial propagation of orchids.
- Both liquid and solid media are used for the orchid tissue culture.
- The explants after being isolated from the shoots are cultured in or on the desired medium – under sterile conditions; offer to produce clones of a plant.

How to Propagate Orchid : Tissue Culture

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How to Propagate Orchid : Tissue Culture



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- Following advantages are having over traditional methods of propagation.
 - The production of exact copies of plants that produce particularly good flowers.
 - To quickly produce mature plants.
 - The production of multiples of plants in the absence of seeds or necessary pollinators to produce seeds.
 - The regeneration of whole plants from plant cells that have been genetically modified.
 - The production of plants in sterile containers that allows them to be moved with greatly reduced chances of transmitting diseases, pests, and pathogens.
 - The production of plants from seeds that otherwise have very low chances of germinating and growing, i.e.: orchids and nepenthes.
 - To clean particular plant of viral and other infections and to quickly multiplie these plants as 'cleaned stock' for horticulture and agriculture.

Diseases and Pests



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- Number of diseases caused by fungi, Virus, bacteria, insects and pests.
- Various fungicides likes Capton, Dithane, Agrosan and Ceresan are effective against fungal & Bacterial Diseases.
- In case of virus diseases is control measures all infected plans should be isolated to prevent spreading.
- The most commonly reported insects pests are thrips, aphids, spidermite, soft scale, mealy bugs, orchid weevil, snail and slugs.
- Can be controlled by insecticides like Parathion, Malathion, BHC, Aldrin, Dieldrin etc.
- Metaldehyde has proved to very effective in killing slugs and snails. Even Beer can be used as a bait.

Orchids in Commerce



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- Vanilla is commercially important; used as a foodstuff flavoring.
(The Coca-Cola company is the world's largest user of vanilla)
- The underground tubers of terrestrial Orchids are ground to a powder and used for cooking, such as in the hot beverage salep or “fox-testicle ice cream” salepi dondurma.
- The scent of Orchids is frequently used by perfumists to identify potential fragrance chemicals.
- Other than this Orchids have virtually no commercial value other than for enjoyment of the flowers.



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Today Orchid are grown on assembles – line method in extensive glasshouses with controlled environment and the sale of Orchid flowers runs in millions of dollars. the modern methods of propagation have bought Orchid cultivation on par with other commercial crops.



Breeding of New Varieties



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- Since 1856 when the first Orchid hybrid produced, a very large number of artificial hybrid have been produced both at intergeneric and interspecific level.
- To date more than 125,000 hybrid have been registered with an average of 10,000 or more every year.
- The success for the production of such a large number of hybrid in every year is due to the fact that most of the orchids genera and species have no generic barriers and they cross freely with each other.
- Most of the orchids genera are still in the process of evolution and most of the orchid groups are in reality only artificial constructs.
- Two factors which have played a major role in the development of orchid hybrids are polyploidy and introgressive hybridization.
- Some genera has been of extraordinary effect and coupled with inter-generic compatibility has culminated in formation of hybrid groups which show both greater size and hybrid vigour as compared to parental species.
- The important genera which have given maximum number of man-made hybrids are Cattleya, Cymbidium, Paphiopedilum, Vanda, Dendrobium.

Breeding of New Varieties



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Some of the important intergeneric hybrid are,

- Ascocentrum X Vanda → Ascocenda
- Arachnis X Vanda → Aranda
- Aerides X Vanda → Aeridovanda
- Brassovola X Cattleya → Brassocattleya
- Phalaenopsis X Vanda → Vandanopsis
- Cattleya X Laelia → Laeliocattleya
- Cattleya X Sophronitis → Sophrocattleya



Arachnis

X

Vanda



Aranda

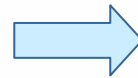




Cattleya

X

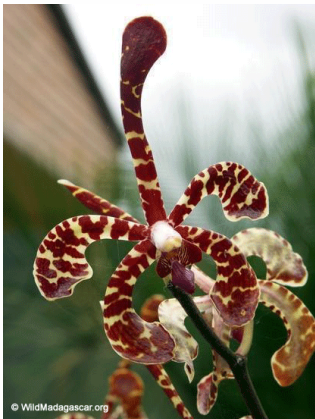
Sophronitis



Sophrocattleya



Arachnis x Ascocentrum x Phalaenopsis x Vanda x Vandopsis



Sutingara

Orchids Cultivations



ORCHIDS

Orchids Cultivations



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- Orchid can be planted in any container with no drainage holes at the bottom but few extra holes 3-5 cm up at the sides of pots.
- The idea is to provide a water reservoir at the bottom of the container from which the medium wicks moisture to the roots.
- Clay pebbles, perlite, gravel, charcoal, coconut husk chips and their combinations is good as growing media for Epiphytes Orchids.
- To pot on Orchid the pot is filled about two third with orchid potting medium, then the plant is set in the pot with its roots spread out.
- The growing tip either centered (monopodials) or placed two fingers from the pot rim (Sympodial)
- Then additional media is packed tightly around the plant to hold it in place.
- If necessary support can be given by fixing piece of wooden.
- most orchids need to be repotted about once every two years.

Orchids Cultivations



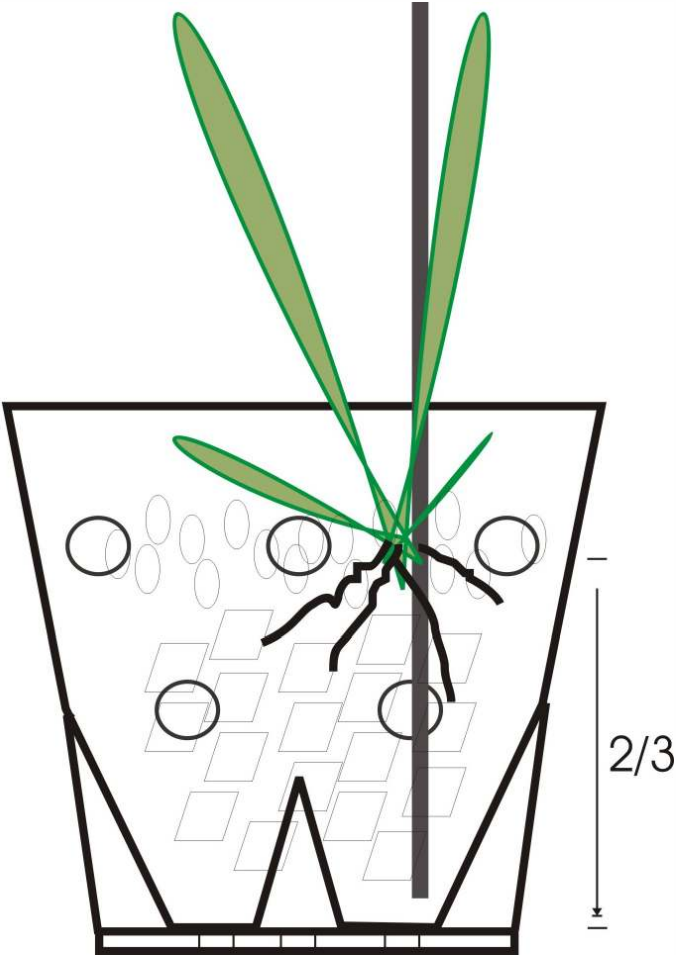
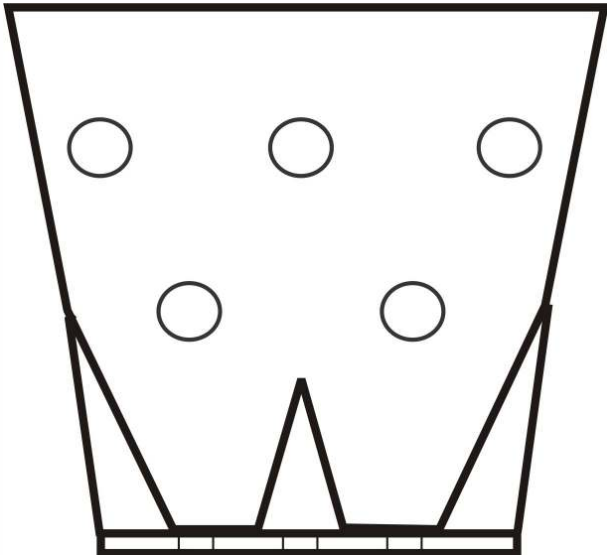
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- Many orchids can be grown in a green house or outdoors. All will require partial shade. Also partial shade can be obtained from foliage plants.
- You can grow and flower many types of orchids in the darkest basement or shadiest apartment with the addition of fluorescent tube lights.
- Watering is the most important factor in orchid culture. A good rule of thumb is to water whenever the medium is dry.
- If you grow the plants in pots suspended in the air, they will dry out more rapidly than bench grown plants and will need watering more frequently.
- Most Orchid roots are adapted to being exposed to air and harsh conditions, but cannot tolerate being wet for more than a day or two.
- Apply the fertilizer in place of a normal water application. It is always best to use fertilizer at $\frac{1}{2}$ the recommended rate.
- More orchids are killed because of over – fertilization and over – watering than by any other cause.

Orchids Cultivations



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Endemic Orchid in Sri Lanka



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- There are 169 Orchids species in Sri Lanka
- Orchid is among the five largest families of flowering plant in Sri Lanka.
- Within Sri Lanka the highest concentration of Orchids is found in the sub mountain areas of wet zone.
- Kandy District (110) Nuwara-Eliya District (51), Ratnapura District (44), Anuradhapura District, Ritigala Mountain (30)
- The Sri Lanka Orchid species are grouped into major categories as follows,
 - Epiphytic Orchids - 99 Species
 - Terrestrial Orchids - 67 Species
 - Saprophytic Orchids - 4 Species

Endemic Orchid in Sri Lanka



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Hetaeria gardneri

A leafy terrestrial orchid about 40cm tall.

Grows in shady places of rain forests up to 1300m altitude.

A threatened species.

Flowers in January

Endemic Orchid in Sri Lanka



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Bulbophyllum wightii

A rare orchid with large flowers and frilled petals growing on trees in the sub-montane and montane forests of Sri Lanka.

A threatened species.

Blooms during February ~ April.



Endemic Orchid in Sri Lanka



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Bromheadia Srilankensis

A rare epiphyte in the wet zone.

Flowers open early in the morning and close by 9.00 am.

Endemic Orchid in Sri Lanka

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Eria tricolor

A very rare orchid similar to the common Lily of the Valley orchid (*Eria bicolor*).

Grows on trees in the sub-montane region of about 1200 ~1400m above sea level.

A protected orchid.

Flowers in April.

Endemic Orchid in Sri Lanka



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Dendrobium Maccarthiae (Vesak Mal)

The most colourful species out of seven native Dendrobium species in Sri Lanka.

Grows on trees in the humid forests of Ratnapura District.

Flowers in the months of May ~ July.

Named after Ms. MacCarthy, wife of the Colonial Secretary in 1855.

A protected plant and is listed as highly threatened species.

Endemic Orchid in Sri Lanka



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Bulbophyllum macraei

Grows on trees in the rain forests, in sub-montane areas and isolated hills such as Ritigala.

A threatened species.

Flowers from June ~ October.

Endemic Orchid in Sri Lanka



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Malaxis discolor

A beautiful ground orchid growing in shady areas of the rain forests and sub montane areas up to 1,800m.

Flowers during July~August.

Endemic Orchid in Sri Lanka



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Obronnia thwaitesii

Obronnia is the largest orchid genus in Sri Lanka represented by 15 species.

This is the only Obronnia species found in the dry and intermediate areas.

A threatened species.

Flowers during July~August.

Endemic Orchid in Sri Lanka



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Ipsea speciosa (*Daffodila* *Orchid, naga meru ala*)

A ground orchid that grows in the grassy areas in the montane zone.

This protected orchid is listed as a highly threatened species.

Flowering begins in September.

Endemic Orchid in Sri Lanka

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Habenaria pterocarpa

Habenaria Pterocarpa

Out of about 500 species of Habenaria in the world, some are cultivated ornamentals.

This species is generally found in the wet zone of Sri Lanka. A highly threatened species.

Flowers during October ~ November

Endemic Orchid in Sri Lanka



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Adrorhizon Purpurascens

This small epiphyte found in the montane forests, is the only species in the genus Adrorhizon which is endemic to Sri Lanka.

A threatened species.

Flowers in September ~ November

Endemic Orchid in Sri Lanka



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Anoectochilus setaceus (Vana Raja)

The most beautiful jewel orchid found in the wet zone of Sri Lanka. Grows on the forest floor under leaf litter. Roots are said to be medicinal.

A threatened species.
Flowers in May ~
September & December ~
January.



Some of the Common Orchid in Sri Lanka



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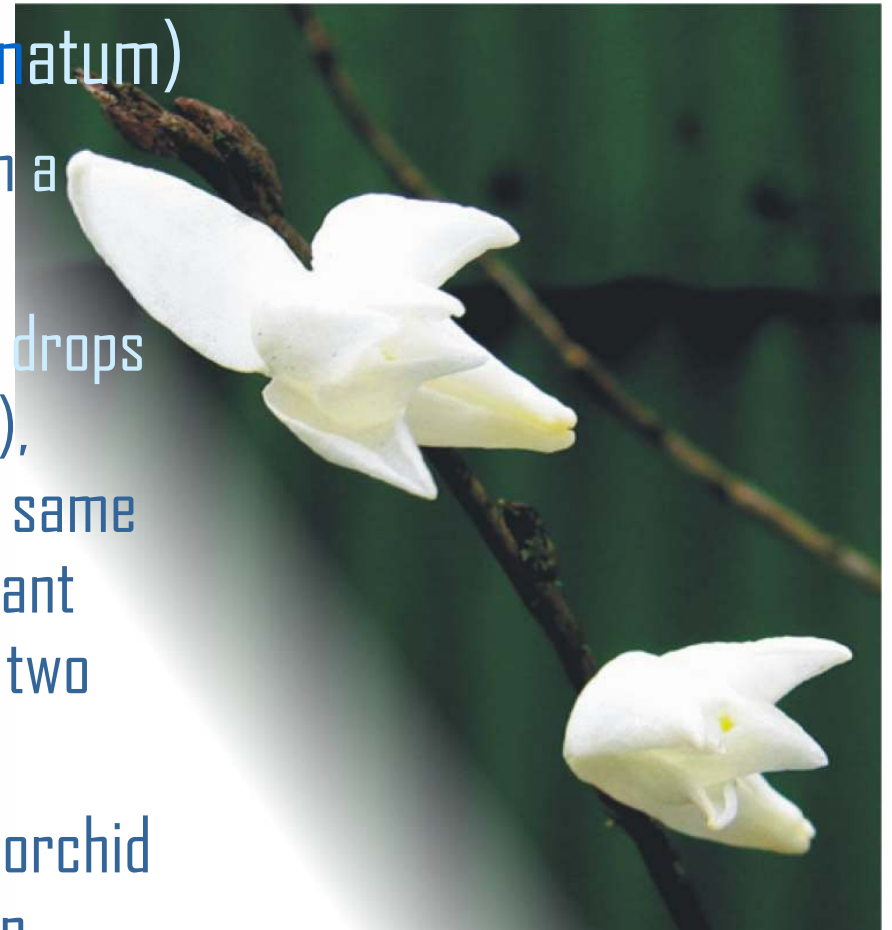
1. Pigeon Orchid
2. Ground Orchid
3. Vanda Miss Joaquim
4. Scorpion/Spider Orchid
5. Kandyan Dander

Common Orchid : Pigeon Orchid

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Pigeon Orchid (*Dendrobium crumenatum*)

- It produces white, fragrant flowers with a yellow tinted throat.
- The bloom cycle is triggered by sudden drops in temperature (at least 5.5 °C or 10 °F), usually as a result of rain, although the same effect can be artificially created. The plant produces a fragrant smell, but only for two days.
- A tropical plant, it is the most common orchid in Singapore, found growing naturally on trees as well as being planted onto street trees by the authorities.



Common Orchid in Sri Lanka : Ground Orchid



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Common Orchid in Sri Lanka : Vanda Miss Joaquim



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- The flower is hybrid between the Burmese Vanda teres and the Malayan Vanda.
- The plant grows in dense clumps of branching stems. It grows best in high humidity and full sunlight.
- Requiring starts to bloom only when the plants top exceeds its supports by 40 to 50 cm.
- This is national Flower of Singapore.
- This makes only nation to have hybrid as her national flower.

Common Orchid : Scorpion/Spider Orchid



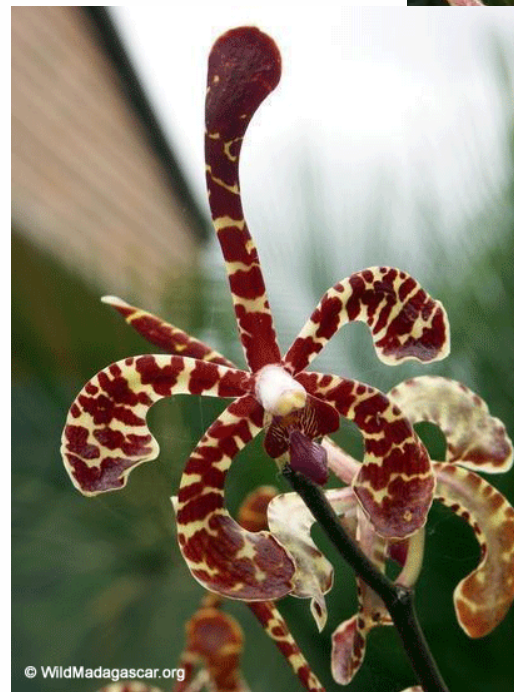
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Aranthera Bartha Braga



ehlebach



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Common Orchid : Kandyan Dancer



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Oncidium Kandyan



Photo Story - Home Garden



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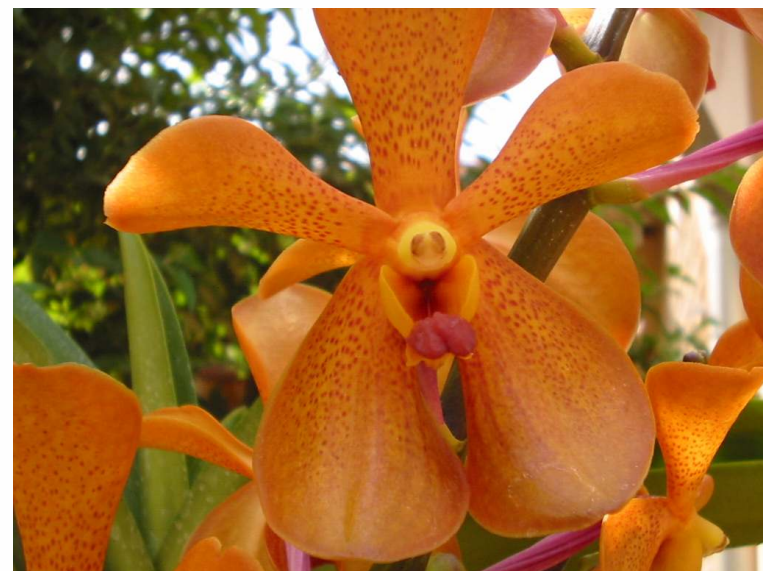
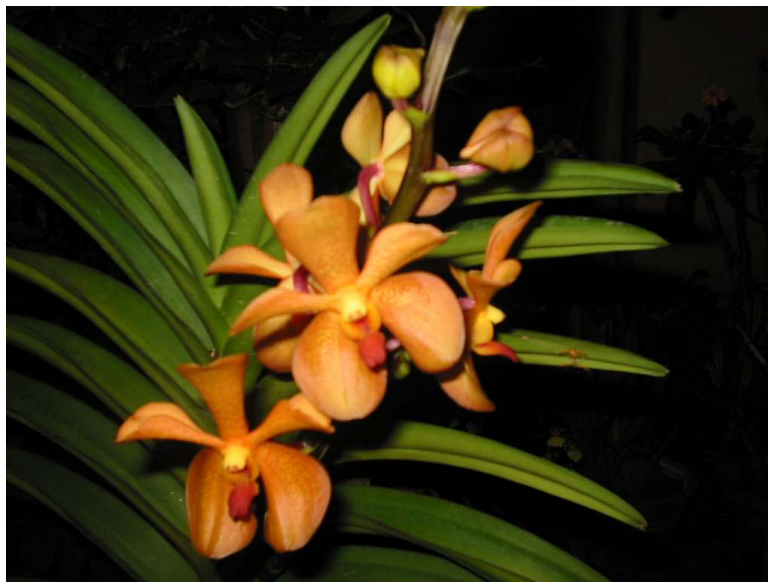


Photo Story - Home Garden



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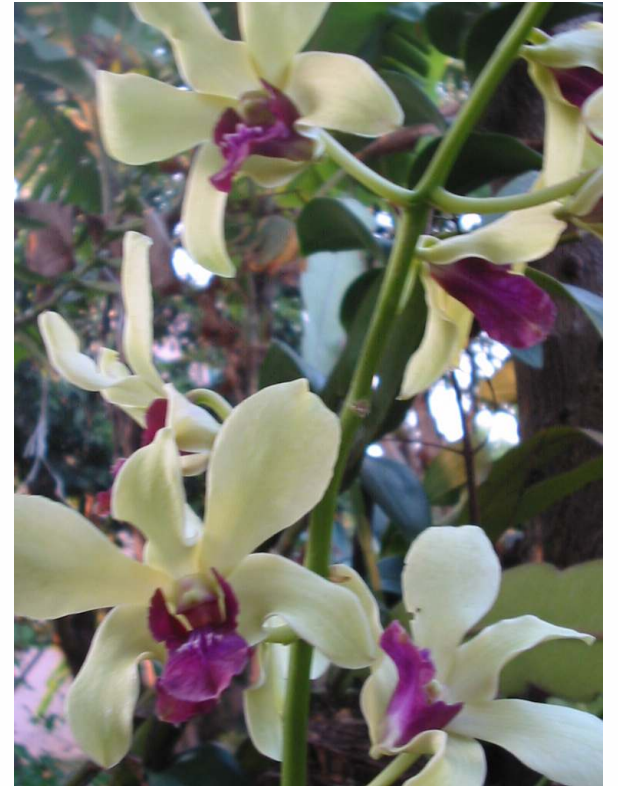
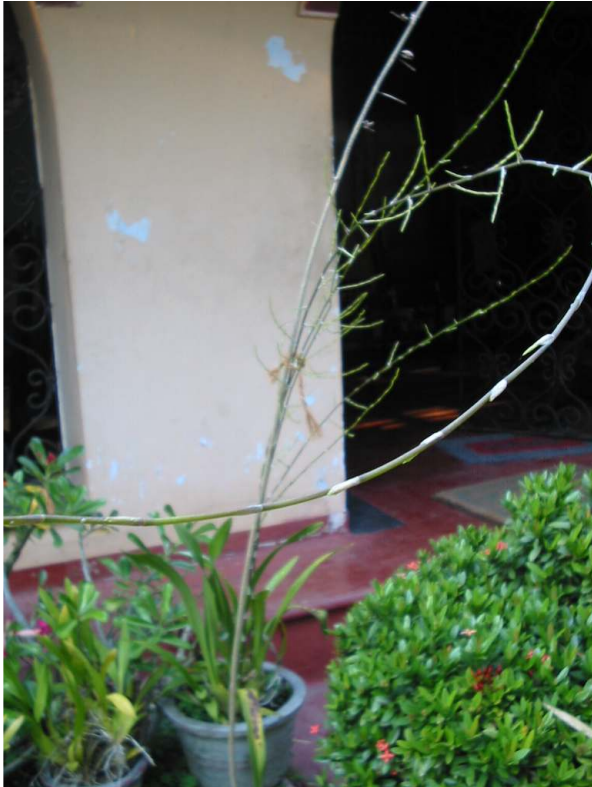


Photo Story - Home Garden



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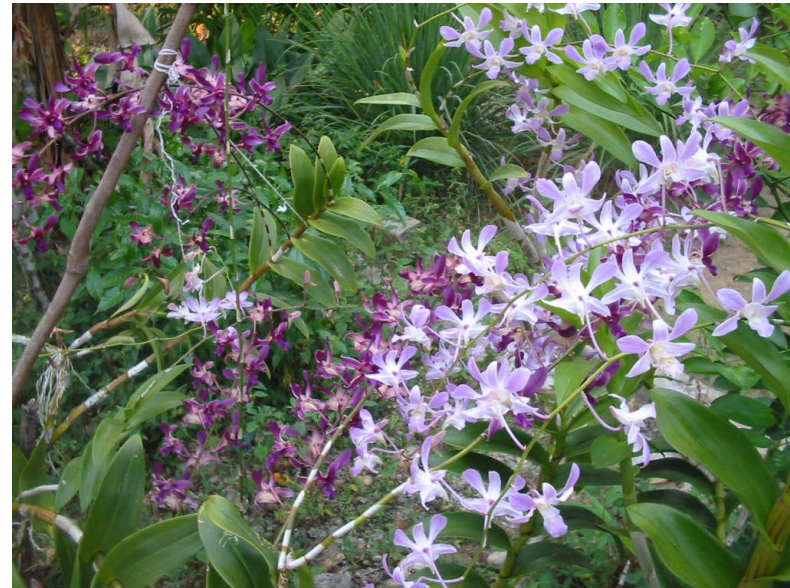


Photo Story - Home Garden



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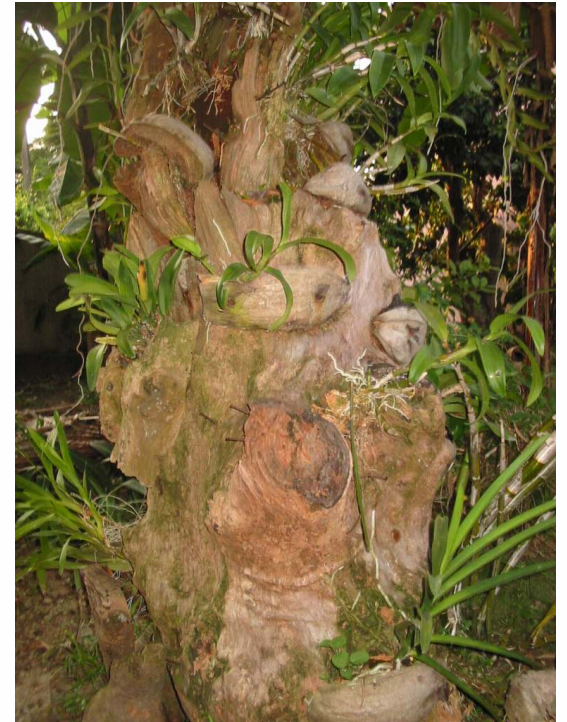


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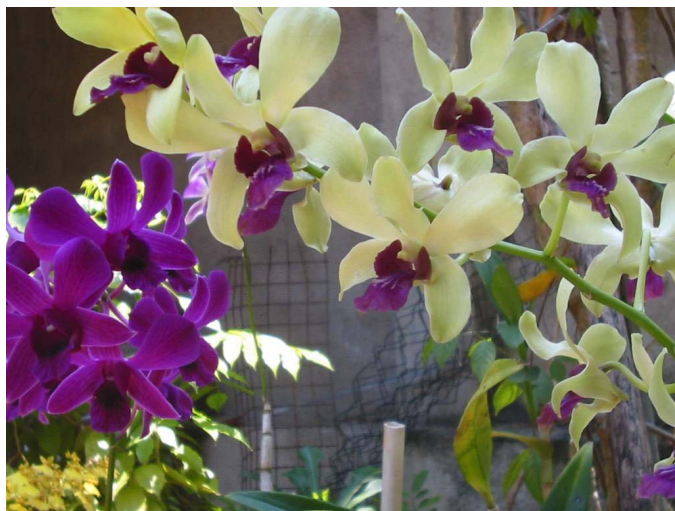


Photo Story - Home Garden



Orchid Flowers in Singapore Airport



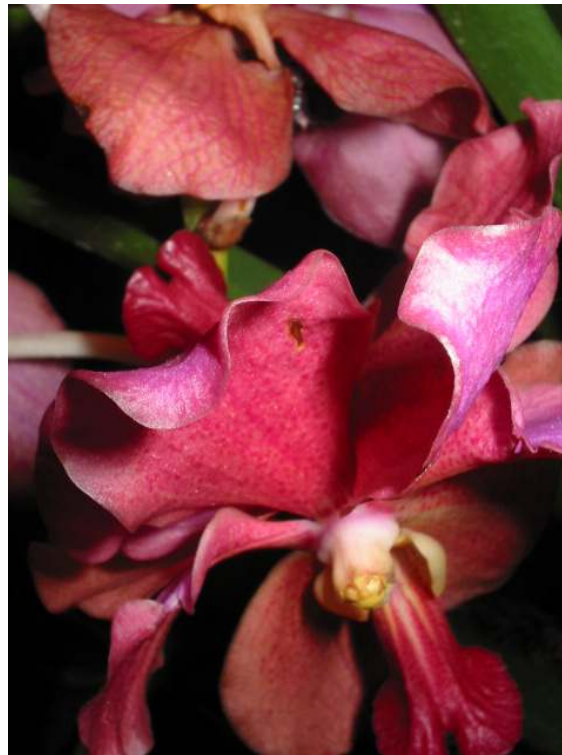
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Orchid Flowers in Singapore Airport



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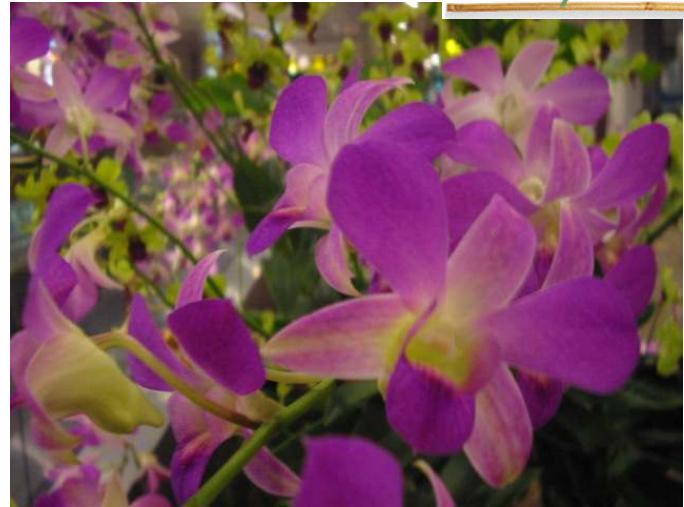
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