

# Orchid – a diversified flower crop

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## Abstract

Orchids comprise the largest family of flowering plants with 25,000 to 35,000 species belonging to 600-800 genera and covers 10% of the flowering plants. They are prized for their incredible diversity in the size, shape and colour and attractiveness of their flowers and high keeping qualities even up to 10 weeks. Orchid scaping, i.e., the use of orchids of one type or one colour into the permanent beds or attached to trees, shrubs or rocks creates some of the most interesting and beautiful gardens imaginable depending upon the cost involvement and micro-climate factors. Almost all spider orchids, terete and semi-terete *Vanda*, *Phaius*, *Calanthe* and Lady's Slippers perform well if they are grown on the ground in bright sunlight with liberal watering and fertilization. Tall growing monopodial orchids are best grown in large clay or plastic pots; *Vanda*, *Rhyncostylis*, *Arachnis* with pendent flower spikes in basket whereas slabs or logs of tree are effective for cool growing orchids. Cattleyas grow well in rockeries. To develop an orchidscape, a gardener should be aware of the flowering period of each orchid to enjoy seasonal burst of flower. *Cymbidium* and *Dendrobium* which flower from winter to spring should be first choice to develop a colour scheme. In balcony gardens, shade loving orchids such as *Bulbophyllum*, *Coelogyne*, *Eria*, *Masxillaria* can be grown by attaching them in free standing rocks or to the masonry wall. An 'Orchid Tree' can easily be established outdoors by mounting a large number of orchids requiring similar light, temperature and humidity to get different colours on the tree throughout the year. Fragrant orchids are delightful in outdoor living areas and *Brassovola*, *Aerides*, *Dendrobium*, *Coelogyne*, *Oncidium*, *Rhyncostylis* and *Zygopetalum* are the best choices to perfume those areas.

**Keywords:** orchids, diversity, orchidscape

## INTRODUCTION

Landscaping is defined as the utilization of plants to accomplish outdoors or indoors for fulfilling aesthetic and functional purposes. It enhances the aesthetic appeal of an area, transforms the simple structure into an attractive one and increases property value. It helps in blending of concrete and architectural creations into natural scenarios. Landscaping creates privacy, checks vehicular and pedestrian traffic and modifies environmental factors. Besides, it creates recreational grounds for relaxation and community interaction; conserves natural resources; provides hobby activities and therapeutic relief and reduces noise and environmental pollution.

Orchids comprise the largest family of flowering plants with 25,000 to 35,000 species belonging to 600-800 genera and covers 10% of the flowering plants. They are prized for their incredible diversity in the size, shape and colour and attractiveness of their flowers and high keeping qualities even up to 10 weeks. Most orchids originated from tropical humid forests of Central and South America, India, Sri Lanka, Burma, South China, Thailand, Malayasia, The Philippines, New Guinea and Australia. Brazilian *Cattleya*, Mexican *Laelia* and Indian *Cymbidium*, *Vanda* and *Dendrobium* have played a major role in developing present day beautiful hybrid orchids which numbers more than 200,000. In the international trade, among top ten cut flowers, orchids rank the sixth position and among orchids *Cymbidium* ranks the first position and in floricultural crops it accounts for 3% of the total cut flower production.

In India, it comprises 140 genera and 1300 species which grow up to an elevation of 5000 m. Indian terrestrials are located in humus rich moist earth under tree shades in North



Western India. Western Ghats harbour the small flowered orchids. Epiphytic orchids are common in North eastern India which grow up to an elevation of 2000 m from sea level. Indian orchid species with high ornamental values and used as breeding materials are *Aerides multiflorum*, *Aerides odoratum*, *Arundina graminifolia*, *Arachnis*, *Bulbophyllum*, *Calanthe masuca*, *Coelogyne elata*, *Coelogyne flavida*, *C. corymbosa*, *Cymbidium aloifolium*, *C. lowianum*, *C. devonianum*, *C. hookerianum*, *C. lancifolium*, *Dendrobium aphyllum*, *D. nobile*, *D. chrysanthum*, *D. farmeri*, *D. chrysanthum*, *D. farmeri*, *D. densiflorum*, *D. moschatum*, *D. fimbriatum*, *D. jenkinsii*, *Paphiopedilum venustum*, *P. spicerianum*, *P. hirsutissimum*, *P. insigne*, *Phaius wallichii*, *Pleione praecox*, *Renanthera imschootiana*, *Rhyncostylis retusa*, *Thunia alba*, *Vanda cristata*, *Vanda caerulea* and *Vanda caeruleascens* (Singh, 1990). In India, some of native genera like *Cymbidium*, *Paphiopedilum*, *Vanda*, *Arachnis* and *Dendrobium* are cultivated on a large scale for cut flower production. The *Cymbidium* is mainly grown in NEH Region, Sikkim, Darjeeling hills, Arunachal Pradesh and Assam. Tropical orchids are cultivated in Kerala and some parts of Tamil Nadu. We should prefer those species which flower during winter and spring months to export flowers to temperate regions from December to May. The orchids have taken a significant position in cut flower industry due to its attractiveness, long shelf life, high productivity, right season of bloom, easy in packing and transportation.

### PLACEMENT OF ORCHIDS IN LANDSCAPES

Placement is a crucial factor when landscaping with orchids. Sites should be selected that receive good air circulation. It is better to have a place for only orchids and to avoid mixing them with annuals and perennials. Most tropical orchids are grown in and on trees. Any tree with rough bark is a fine place for orchids. Terrestrial orchids such as *Phaius*, *Spathoglottis*, etc. are grown directly in soil (Kramer, 2006). Areas around pools are very suitable for landscaping with orchids. They should be attached to trees surrounding the pool and planted in rockeries in close proximity to the pools. Pools increase their humidity in their vicinity and help to maintain a more even air temperature. Schomburgkias, cattleyas and their hybrids will grow well in well drained rockeries. Standard size cymbidiums provide eye catching feature in the large rockeries and planted particularly as mass plantings in garden beds.

### ORCHIDS - A COMPONENT ADAPTED TO THE DIVERSIFIED CLIMATE

Orchids are found in nearly every environment in the world. Most of the orchids grown in the home are native to the tropical and subtropical areas of South America. They are usually epiphytic, meaning they grow on the sides of trees, or lithophytic, meaning they grow on rocks. Orchids originating from temperate regions of the world are generally terrestrial, meaning they grow in the soil. Orchids are quite resilient, and can survive many years in the home with proper care. Epiphytic orchids like *Thunia*, *Coelogyne*, *Cattleya*, *Laelia*, *Dendrobium*, *Calanthe*, *Bulbophyllum*, *Aerides*, *Phalaenopsis*, *Aranda* and *Aranthera* with thick leaves and succulent stems have CAM and are drought tolerant with higher water use efficiency.

Orchids are classified into three categories based on temperature. Warm orchids like *Aerides*, *Vanda*, *Rhyncostylis* and some *Dendrobium* species grow at day temperature upto 32.2 and 15.5°C for a minimum night temperature; intermediate species like *Cattleya*, *Laelia*, *Brassovola*, *Oncidium*, *Miltonia*, etc. prefer 26.6°C days and 12.8°C nights. Cool species such as *Cymbidium*, *Odontoglossum*, *Cypripedium*, etc. prefer 24°C days and 10°C nights. Most orchids require a lower night temperature for both robust growth and to initiate blooms. A night temperature of 10-13°C is ideal for initiation of flowering in *Cymbidium*.

Most orchids generally prefer indirect or filtered light. Although it varies species to species, growth habit and habitat, as the rule of the thumb, 50% shading is always advised for most of the commercial orchids. Under enough light, orchid plants have short, plump stems with bright green leathery leaves and yellowing, stunting and scorching of plants under too much of light and under too much shade plants have darker green, soft and succulent leaves with thin and spiny stems. Low light orchid is classified as 1200-2000 f.c. of light intensity originated from dense forests e.g., *Phalaenopsis*, *Calanthe*, etc. Medium light

orchids grow at the top of the tree canopies and prefer 2000-3000 f.c. of light intensity. *Cattleya* and related genera and hybrids fall into this category. High light orchids grow in full sun habitats and need 3000 f.c. or more light intensity. *Cymbidium* and vandaceous plants like high light to flower well.

The single dominant factor which affects the cultivation of orchid is humidity which should be as high as 75-85%. It varies species to species depending upon habit of growth, light, temperature and ecotypes. Monopodial orchids require higher humidity than sympodial ones. As rule of thumb, in high temperature, humidity should be kept high. Provisions of misting units or foggers or even humidifiers will ensure adequate humidity. Standing water beneath the benches may be kept to improve humidity.

### **ORCHIDS-ORGANICALLY VIABLE**

Each orchid genus has different requirements for potting media collected from locally available organic sources. It is very important to have the correct medium for each type of orchid, depending on whether it is terrestrial or epiphytic. Growing media commonly include fir bark, coconut husk, sphagnum moss, tree fern fibres, coco peat, saw dust and perlite, and frequently a mixture of two or three of these materials. All orchids potted in a typical bark medium need to be repotted every 18 to 24 months, depending on the needs of the individual plant.

### **LANDSCAPING WITH ORCHIDS**

Orchid scaping is the use of orchids permanently planted into specially prepared beds or attached to trees, shrubs or rocks in the appropriate spot in the garden. Combined with other traditional ornamentals such as palms, ferns, flowering perennials, shrubs, trees and herbs, etc. it is easy to create some of the most interesting and beautiful gardens imaginable, depending upon the cost involvement and microclimatic factors. Many orchids can be grown on rocks and logs for placing in the landscape. They are attached to either cut wooden logs, coconut logs or living trees and shrubs. Once the orchids are established they will attach to the trees and logs (Teoh, 2005).

There are two main reasons for growing orchids in beds.

- For landscaping;
- To grow large numbers of a type for the flower market. In order to create the visual impact in landscaping, the orchids should be planted in a single bed of one type and of one colour. If somebody has only one or two plants of a type, it is advisable to grow them in pots. Almost all spider orchids (*Arachnis* and their intergeneric hybrids, terete and semi-terete vanda, *Phaius tankervilleae*, *Calanthe* spp., and Lady Slippers perform well, if they are grown on the ground in full sun with liberal watering and fertilization. Sloping or flat ground with good drainage provides the ideal location for orchid beds. The bed size should be of 2 m long and 1 m breadth. The best size for planting out in beds is when they reached a height of 70 cm. Each cutting should have at least two strong roots. The newly planted orchids require some shade from direct sunlight and they need water twice a day, morning and evening. They are fertilized with dilute fertilizers at least twice a week. When the plants are established, controlled release fertilizers or powdered bone meal can be scattered over the ground cover. Ground orchids are extremely hardy and responds fertilizers.

### **ORCHIDS - AS POTTED PLANTS/HANGING BASKETS/TRAYS**

Potted orchids last for longer than cut flowers, their shelf life being three weeks to four months depending upon species and hybrids (Nagrare and Pal, 2008). Tall growing monopodial orchids are best grown in large clay pots up to 30 cm in diameter. Terrestrial and semi-terrestrial plants like *Paphiopedilum* and *Cymbidium* perform better in deep pots. Orchid plants as a rule grow to be near one another to aid a microclimate higher in humidity. Basket culture is useful for those orchids like *Vanda*, *Rhyncostylis*, *Arachnis* with pendent flower spikes and long dangling roots. Clay pots are best suitable for terrestrial orchids. Plastic pots are used for epiphytes. Slabs or logs of tree fern are effective for cool growing

orchids.

A potting media of terrestrial orchids should have equal parts of leaf mould, soil and sand. Clay soil, bone meal, sawdust, charcoal dust, manure, wood savings, etc. are also used in various proportions for satisfactory growth of terrestrial orchids. A potting medium consisting of charcoal, brick pieces and coconut fibre in equal proportions is ideal for vegetative growth and flowering of epiphytic orchids like *Aerides*, *Dendrobium*, etc. Under low humid conditions (30%), plastic pots with a mixture of bark/perlite/sphagnum moss or osmunda are used. Under average humidity (35-50%), it is advisable to use plastic pots with a mixture of bark and sphagnum moss. Under high humidity (55% and above), clay pots are used with bark, stone culture, charcoal or tree fern. Important orchid genera used as potted plants in the international market are *Phalaenopsis*, *Oncidium*, *Miltonia*, *Cymbidium*, *Paphiopedilum*, *Dendrobium*, *Cattleya*, *Ascocenda*, *Vanda*, *Brassia*, *Miltonia* and *Epidendrum* (Lopez and Runkle, 2005).

Orchids are light feeders and they require nitrogen from beginning to two-third of their life cycle. During rest period, they do not need any fertilizers. During flower initiation and inflorescence development plant are fed with less nitrogen, more phosphorus and potassium. During the blooming time, a small level of nitrogen and phosphorus and high levels of potassium are maintained. In orchids, foliar feeding is found to be ideal. Frequent application of fertilizers in low concentrations is the best way of feeding orchids. A concentration of 0.2 to 0.3% of 30:10:10 (N:P:K) at vegetative stage and 10:20:20 (N:P:K) at blooming stage are applied for quality flower production. Sometimes, fresh coconut water, diluted cow urine are also useful as foliar sprays.

#### COLOUR SCHEME WITH ORCHIDS

To develop an orchidscape, one gardener should aware of the flowering period of each orchid. Some gardeners enjoy seasonal burst of colour. For them, cymbidiums and dendrobiums which flower from winter to spring should be the first choice (Friend, 2004).

- Winter flowering orchids: *Bulbophyllum hirtum*, *B. putidum*, *Cymbidium lowianum*, *C. mastersii*, *Eria bambusifolia*, *Paphiopedilum farrieanum*, *P. insigne*, *P. spicearum*, *Pleione maculata*, *P. praecox*.
- Spring flowering orchids: *Ascocentrum ampullaceum*, *Calanthe plantaginea*, *Coelogyne cristata*, *Cymbidium devonianum*, *C. eburneum*, *Paphiopedilum hirsutissimum*, *P. villosum*, *Phalaenopsis lobii*, *Pleione humilis*.
- Summer flowering orchids: *Coelogyne corymbosa*, *C. cristata*, *C. nitida*, *C. ochracea*, *Cymbidium aloifolium*, *Dendrobium fimbriatum*, *D. heterocarpum*, *D. nobile*, *P. mannii*, *Pleione hookeriana*, *Phaius flavus*, *P. tankervillae*, *Renanthera imschootiana*, *Rhyncostylis retusa*, *Spathoglottis plicata*, *Vanda coerulea*, *Vanda cristata*, *Vanda stangeana*, *Vanda tessellate*.

Orchid hybrids of *Cymbidium*, *Dendrobium*, *Vanda*, *Phalaenopsis*, *Oncidium*, *Cattleya*, *Paphiopedilum*, *Mokara*, *Aranda*, *Renantanda*, etc. with different colour and forms are used as cut flowers, floral display and as exhibits (Bhattacharjee and De, 2005):

- Orchids in balcony gardens: in balcony gardens, lithophytic orchids can be grown by attaching them in free standing rocks or to the balcony's masonry walls. Genera suitable for shady location may include *Bulbophyllum*, *Coelogyne*, *Eria*, *Maxillaria*, some *Oncidiums*, *Sarchochilus* hybrids, *Phalaenopsis* and *Cattleya* hybrids.
- Orchid tree: an orchid tree is a variation on mounting orchids except the placement of many orchids on a branch or branches to give a completely natural look (Taylor, 2009). It is used in those areas of the country where orchids are grown outdoors most of the year. Usually, the larger plants are attached to the bottom and the smallest on the upper portions for aesthetic reasons and to provide extra weight at the bottom to balance the weight of the structure. It is better to select those plants which require similar light, temperature and humidity conditions. Another factor that has to be considered is flowering times to get different colours on the tree throughout the year. The chosen plants are mounted on the tree with sphagnum moss and fishing wire. Thorough misting and maintenance of humidity are essential

for a month to establish the plants on the structure.

- Herbal garden with orchids: tribal people of North eastern hill region use wild orchids for a variety of folk medicine as orchids are rich in alkaloids, flavonoids, glycosides, carbohydrates and other phytochemicals (Table 1).

Table 1. Common medicinal orchids of NEH Region (Rao, 2004).

Name of species	Uses
<i>Acampe papillosa</i>	Root is used for rheumatism, sciatica and uterine diseases
<i>Aerides odorata</i>	The ground fruit used for healing wounds. Juice of leaves is used to heal boils in ear and nose
<i>Cymbidium aloifolium</i>	Ground plant to cure chronic illness, weakness of eyes, vertigo and paralysis
<i>Dendrobium nobile</i>	Fresh and dried stems used in preparation of Chinese drugs for longevity and as aphrodisiac, stomachic and analgesic
<i>Habenaria acuminata</i>	Roots are used as tonic
<i>Phaius tankervilleae</i>	Pseudobulbs are used to heal swellings of hands and legs, poultice to soothe pain of abscess
<i>Pholidota imbricata</i>	Pseudobulbs are mixed with mustard oil and applied on joints for rheumatic pain
<i>Rhyncostylis retusa</i>	Roots are effective against rheumatism, asthma, tuberculosis, cramps, epilepsy, vertigo, kidney stone, menstrual disorder
<i>Arundina graminifolia</i>	Bulbous stems are used to heal cracks
<i>Dendrobium densiflorum</i>	Leaves crushed to paste with salt and applied on fractured area to set bones
<i>Vanda corulea</i>	Leaf juice is used against diarrhea, dysentery and external application for skin diseases
<i>Vanda teres</i>	Leaf paste to reduce temperature in fever
<i>Vanda cristata</i>	Leaves are used as tonic and expectorant

- Fragrant orchids: fragrant orchids are delightful in the outdoor living areas. *Brassovola* species are perfumed at night and the Australian native *Dendrobiums* that perfume the air on warm spring mornings. Other aromatic orchids are *Aerides multiflorum*, *Aerides odoratum*, *Aeranthus Bulbophyllum odoratissimum*, *Cattleya maxima*, *Coelogyne cristata*, *Coelogyne ochracea*, *Cymbidium ensifolium*, *Dendrobium nobile*, *Epidendrum cristatum*, *Epidendrum floribundum*, *Epidendrum nocturnum*, *Lycaste*, *Oncidium spaceolatum*, *Phaius tankervilleae*, *Rhyncostylis retusa*, *Vanda cristata*, *Vanda tessellata*, *Zygopetalum intermedium*.

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