

THE ORCHID SOCIETY OF KARNATAKA

e- Newsletter
TOSKAR



21st September 2014



NEW

A lovely glossy Orchid Newsletter published quarterly during 2006 and 2007 was unable to reach all of you for reasons beyond TOSKAR's control. After a hiatus of seven full years the Executive Committee of TOSKAR has revived the publication as an online e-Newsletter instead of as a Glossy Magazine in its earlier hard copy format. The scope and content of the e-Newsletter has been suitably modified keeping in view of the present day trends. Instead of the more academic and all-inclusive research oriented publication, this e-Newsletter is making efforts to serve the ever growing membership of amateur orchid hobbyists and scientific fraternity. With an article in Kannada language we hope the information will be further useful.

TOSKAR planned to release this revival issue at their Third Annual Orchid Show of 2014 then scheduled for September. Although the show is now moved to October the schedule for the e-Newsletter remains unchanged.

On every Equinox/Solstice (Sept 21st, Dec 21st, March 21st and June 21st) TOSKAR members can look forward to receiving this quarterly bilingual e-Newsletter.

This issue begins with an instructive series for the beginners by Dr Shashidhar Sastry. Complimenting Dr Shashidhar's Beginners' Section is an informative article by Mr. Sriram Kumar on the quality of water to grow these special plants. Mr. Suresh Kalyanpur provides a good overview on one of the most popular and spectacular Orchid Hybrids – the Cattleya group. Ms Nalini Kottoli adds the local flavor with her Kannada write up on the elegant Spathoglottis. Dr Hegde makes an in depth analysis on the breeding of orchids in India.

It is indeed an honor for TOSKAR that Dr Shashidhar was invited to collaborate with the French Organization in its Gazette de Orchidophile. An English version of that article by Dr. Shashidhar on Indian Orchids is now included in this issue for those of us who are not conversant in French.

Our Society has recently gained recognition in the press – as Mr. Srinivasa Garudachar alerted us, there was a brief write up about our Orchid Society in the Deccan Herald on June 26, 2014. <http://www.deccanherald.com/content/415863/its-like-raising-child.html>

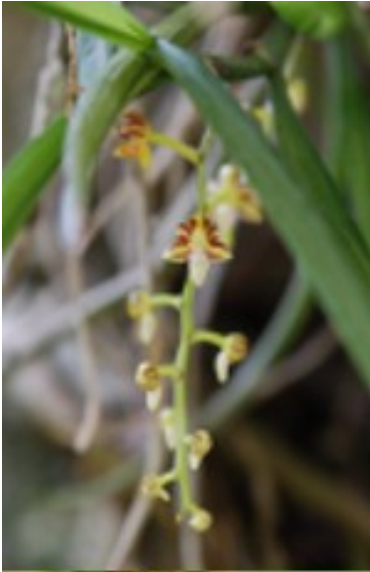
A short field trip to Turlahalli was organized. Mr Srikanth Parthasarathy enlightens the readers about that field trip to see this dainty terrestrial orchid species in its natural habitat. Habenaria is also of medicinal value.

Mr. Sriranth has also contributed a brief review of the photography exhibition on Insects and Orchids (Sept 8 - 13) held at the Karnataka Chitrakala Parishat wherein the eye-catching orchid photographs are by none other than our Dr Shashidhar Sastry.



Vani Hardev Ph.D
editor.nl@toskar.org





In This Issue:

Beginners' Section by Dr K.S. Shashidhar

Water Quality by Sri Sriram Kumar

Cattleyas by Sri Suresh Kalyanpur

Spathoglottis by Smt Nalini Kottolli

Orchid Breeding in India by Dr S. Hegde

Orchid Scenario in India
by Dr K.S. Shashidhar

Orchid Events

Field Trip

Exhibition at CKP



Cover Illustration: *Laeliocattleya* Casitas Springs 'Linden'
By Dr S.Hegde

Beginners Section

Dr. K.S. Shashidhar

Watch out how you take care of your Orchids!!!

There is a feeling among most of the people who have gardening as a hobby that, orchids are difficult plants to grow and need lot of attention and care. Contrary to this belief, they are the easiest to grow provided you 'listen to them', 'watch them' and provide 'what they want'. Once they are settled with your care, they live happily and make you enjoy their floral beauty. Well, I know it sounds easy, as the saying goes 'it is easier said than done' in most of the cases. But then, to achieve something good we have to make some efforts. Let us see some of the important parameters one has to take into account to successfully grow orchids. Before we look into these factors, give a thought about the way orchid grows in nature and what nature provides them. The whole process of growing orchids involves, trying to copy what nature provides and try to replicate the same (to the extent possible). I will start with selection of plant and move on to briefly discuss the other important factors.

Selection of plant: Before you really get to the process of selection of a good plant, decide whether your interest lies in growing species (species orchids are those that grow wild in nature) or hybrids (by crossing one orchid with another – hybridization – hybrids are produced). I for one, would suggest for the beginners to go for hybrids because they are relatively easy to grow and bloom well. For a beginner nothing like getting the first bloom which will inspire them to no end. Once you become conversant with growing different types of orchid hybrids, you can then venture into growing species. While selecting a plant, consider the following points

1. Plant should be healthy looking without any marks, spots on leaves, and with plenty of roots (active).



2. The plant should have at least one old growth, one current and one for the next season if it is a sympodial orchid like Dendrobium.



3. If it is a monopodial like Vanda or Ascocenda , the plant should at least be foot and a half with plenty of aerial roots and actively growing.



4. If the current growth has a spike it is most welcome.
5. The plant – whether it is a species or hybrid – should have a label. This is important as plants without labels may remain unknown; in addition, with label one can be conversant with its culture.



In Bangalore conditions, Dendrobiums, Cattleyas, Oncidiums, Phalaenopsis and many Vandaceous orchids can easily be grown. However, with gaining of experience one can go for Slipper orchid and its hybrids, and other hybrids and species which are being imported and available in the market.

Location of the plant: After selection of a plant, locating the plant is very important. The important aspects here are light, aeration and humidity. We will make an effort to understand about these factors together as several of them are interdependent. In cities like Bangalore, space available is small. But our interest makes us find appropriate places for orchids and many have been growing them successfully in balconies, windowsills and in the front yards.



When you locate your plants in the limited spaces available, providing proper light conditions for growth and flowering is important. For all the genera and alliance mentioned above, except Phalaenopsis, need bright light. Please remember what humans perceive as bright light may not be sufficient enough for orchid's photosynthesis. Orchids need bright light for a minimum period of 6 hours. Morning direct sun up to 11 AM is fine with many of the genera listed. Avoid afternoon direct sun. Areas and spaces facing East and North are most preferred. If you have space in the front yard, then light may not be a limiting factor except that you have to provide filtered light. If you have ample space on the terrace (make sure that problem of seepage does not occur) one can go for a regular green house or shade net house.

Providing few hours of bright light and then shade will not make orchids bloom though they may be growing well. The common problem of orchids not flowering is the result of insufficient light. Dark green leaf colour is indication of low light conditions and similarly pale leaf colour may be due to excess light. Avoid both the extremes.

While we are looking at proper light, we must also consider temperature as it is one of the important factors controlling the growth and flowering. One should be aware of the general classification of orchids based on temperature as cool-growing, intermediate and warm-growing. Many of the species and their hybrids which are from cool regions will not do well in Bangalore conditions. Classic example being the cool-growing Cymbidiums (both species and hybrids) from places like Sikkim, Shillong, Kalimpong and Darjeeling will not flower in Bangalore. This is mainly because of lack of diurnal variation in temperature (at least a difference of 13-14°C between day and night temperatures has to be there for flower initiation). Many of the Coelogynes also have cool requirements. Hence, before buying a plant whether it is a species or hybrid, please check its requirement, one need not look for absolute values as the requirements, a range will do. If the plant has a growing range of cool to warm, maybe we can try it here in Bangalore. If it is intermediate and warm-growing it will definitely do well. My advice for the beginners is try your hands at easy to grow orchids and as you become conversant, and gain confidence then go for specialised plants like Lady slippers.

Humidity is another of the important factors influencing the orchid growth and flowering. Many of us buy or collect some orchids doing very well on mounting. Then without understanding the requirements of humidity, we simply mount it on a piece of wood, bark etc as a result, one fine day the plant just vanishes!! The problem here is, you have introduced the orchid to totally different conditions (may be lack of humidity, improper mounting). Every orchid plant, when taken out from its established surroundings and introduced in a new environment, it needs time to adjust and grow and recover, provided the conditions improve humidity; and 'no disturbance' to the plant is important so that it can start putting out new roots and shoots. Trust me, if the conditions are ideal, the plant will put out new roots (in case of epiphytes) in a fortnight time. Give the orchid time to get used to its new home. Many of us ignore the fact that orchids are slow growing unlike the annuals and other flowering ones we see around us. Before the plant gets used to its new environment, we become impatient and re pot it! Wow! there goes your orchid for a 'sixer', first, the 'new environment' itself was a shock to it and you give it one more by re potting it. The plant gets confused and will never settle down. Hence, keep it in one place, provide it with near to natural conditions and be patient. Just wait.

In the absence of humidity, the entire surrounding atmosphere will be dry and the orchid's aerial roots which normally absorb moisture from the atmosphere feel dry; the roots may first go into a dormant condition and then eventually may dry and die. The reflectance of a good plant growth is seen through its root growth, hence, keep the roots moist. Humidity levels below 50 % are not comfortable for the orchids. In Bangalore, the months from Dec – May will have low humidity

levels and therefore, one has to take care of humidity.

Good aeration influences orchid growth a lot especially in a green house as the natural air flow is somewhat restricted. Considering the natural habitat of orchids where they enjoy plenty of aeration, providing proper aeration will do wonders. The basic fact of providing big chunks of brickbats, charcoal, LECA (Light Weight Expanded Clay Aggregates – it is clay fired at a fairly high temperature) is to provide good aeration for the roots. Placing the pots on a bench, mounting the plants provide good aeration.

In a green house condition, during summer, the air gets heated and moves to the top and is trapped near the roof of the green house. If you look at the profile, there will be hot air in the top and then cool air in the bottom. This increases the temperature within the green house. This hot air trapped may desiccate the aerial roots. It is important that fans should be provided so that there will be a mixture of hot and cool air that is more appropriate for the orchids. Unless one has cooling pads in the green house, providing aeration through fans is a must. Providing few hours of aeration through operating blowing fans will enable mixture of this hot and cool air and also to some extent it drives out the hot air.

High temperature and high humidity and stagnant atmosphere in the green house is an ideal situation for onset of diseases. This stagnated atmosphere can be cleared with fans. But if you are keeping the plants in an open area this problem does not arise.

(The other factors of nutrition, watering, propagation shall be discussed in the next issue of the newsletter)



Water Quality for Orchids

Sriram Kumar

Is orchid growing becoming hi tech!!!!, on one side you have growers who simply water with a hose using whatever water source they have and on the other end are those growers who have sprinklers, misters and foggers, pH meters; and are mindful of the quality of water they use for their orchids. Well I would say, if you want to grow orchids successfully do things differently than others – the result – you get specimen plants. Following paragraphs could be a little hi tech!!! Bear with it. But it is just a matter of time before you start appreciating the finer requirements of orchids and the results.

The main parameters for better orchid growth and flowering are light, temperature, Carbon dioxide and water. Compared to natural conditions in which orchids grow, in its culture, we tend to water (sometimes excessively) not taking into consideration its quality, and then in our overzealous effort we apply excess fertiliser resulting in damages to the orchids. These damages often are not easily noticeable or diagnosed and by the time we notice, it could be little too late.

Quality of water is more important than the fertilizer or growing medium. Coming to the quality of water, though rain water is the best, at times it may be difficult for every grower to store it and use it for prolonged periods. In places like Bangalore in spite of a good monsoon, harvesting the rain water tends to be somewhat difficult though not impossible. The next type of water available to us in Bangalore is the water supplied through BWSSB. The quantum of dissolved salts in this varies from 70-120 ppm. Addition of chlorine is a normal practice for purification purposes, it is always better to use this water after 24 hours so that the chlorine dissipates. Presence of chlorine harms orchids. Another common source of water for most of us is the bore well water. Many of us have this tested mainly for its potability. If you have got it tested then look for various other parameters and the accepted ranges for using the same for your orchids. The range of dissolved salts content in bore well water varies from 300 – 600 ppm. The other options are water purified through Reverse Osmosis, de-ionisation or distillation. In some places they use ‘softened water’ which is not good as the process of ‘softening’ involves substituting with sodium for other salts such as Calcium, Magnesium and Iron carbonates which tend to increase the toxicity of the water. The RO water may not have the trace elements and others required for the plants as during the process all these are removed. We may have to add fertiliser and other supplements to meet the requirements. Another aspect we have to keep in mind is the amount of water RO system wastes. Approximately RO system wastes 3-5x of normal water to produce 1x of RO water and such a wastage is certainly not advisable from a sustainable point of view.

Water Quality is very important to grow orchids at their best. Poor quality of water would build salts around the root and would injure and/or kill orchid roots

Parameters for water quality

Total Dissolved Solids (TDS): This is the total quantity of dissolved salts present in water. This includes dissolved solids like Sodium chlorides, sulphates, Calcium bicarbonates, nitrates, phosphates, Iron, and Magnesium. If a sample of water has high TDS values it directly indicates the amount of dissolved salts. This is not suitable for orchids as this kind of water makes the nutrients supplied through fertilizer unavailable for the plants. Therefore, if the water has high TDS values reduce the fertilizer application.

TDS levels are measured using an EC (Electrical Conductivity) meter. TDS meters (HM Digital) are available in market for around Rs.600 and convert the EC to PPM (Parts Per Million).

PPM Value

Favourability

<60 PPM	Perfect Condition to grow orchids	Paphs, Phrags & Pleurothallids do not grow well if TDS is >60
60-120 PPM	Suitable	Majority of the genera do well
120-200 PPM	Moderate	Majority of the genera do well
200-300 PPM	Limited choice & possibly not best growing specimens	Dendrobium hybrids & Phal hybrids do ok but not at their best potential
>300 PPM	Not Suitable to grow orchids	

pH of Water: It is the hydrogen ion concentration in water. pH of water affects the solubility of fertilizers in water. The higher the water pH, lower the solubility of the fertilizer. Water pH of around 5.5-6.5 is very good for growing orchids. Combined TDS + pH meters available for around Rs.1000 to measure the TDS & pH of the water. pH of pure water such as RO water and distilled water will change the moment you add fertilizer or when it comes into contact with organic media which could be acidic. Whereas in case of 'hard water' (water high in dissolved minerals) pH is important as it does not change quickly. Especially when we use sprinklers or misters with this hard water we can observe the white chalky substance left behind on media, on the mounts, or in the pots. This hinders root growth, because of this very reason, flushing after every 4-5 waterings is important. The conditions are to be slightly acidic for best availability of most nutrients.

TDS readings for various Water Source at Ramamurthy Nagar, Bangalore

Source	TDS
Rain Water	25-40 PPM
Bore well	350-400 PPM
Tanker Supply	350-400 PPM
BWSSB Supply	120 PPM

I have started collecting rainwater from my terrace in a barrel and use it for my daily use and orchids love it.

Pure water or rainwater could have lower levels of calcium and magnesium and could impact the health of the orchids. Calcium is responsible for strong and healthy cell wall; calcium deficiency would weaken the cell walls and make them susceptible to fungal and bacterial infections.

It is recommended to use high TDS water once in 3-4 waterings to compensate for calcium deficiency or use a magnesium/calcium supplement with rainwater in the fertilizing regimen or use a fertilizer that has micronutrients

Solutions for bad water quality

- 1) Easiest solution would be to collect rainwater in barrels and store and use them for watering orchids. This is what I do at my home.
- 2) If the number of orchids in your collection is small then possibly look at using distilled water.
- 3) If the number of orchids in your collection is more, look at using a reverse osmosis (RO) setup. If you have a RO setup for your drinking water, you could use the same water
- 4) If we use only rainwater, then we would have to supplement calcium to the plants in some form, alternatively, we could use regular tap water once in every four waterings to

supplement calcium.

Other practices to avoid

- 1) Using Water softeners would worsen the situation by increasing sodium or potassium chloride in the water which is harmful for orchids
- 2) Boling water would not remove the minerals but increases their concentration as evaporation results in more mineral residue.
- 3) Using chlorinated water directly is harmful. If the water is chlorinated then leaving the water in an open vessel for 24 hours would usually be sufficient for chlorine to evaporate.
- 4) Using chloramine water would be more harmful. Unlike chlorine treated water, no easy process can remove chloramine from the water.

References

Orchids for Dummies

Orchids of Asia by Eng-Soon Teoh

<http://staugorchidsociety.org/PDF/IPAWaterQuality.pdf>

Cattleyas, growing them and understanding their cultivation needs

Suresh Kalyanpur

The first *Cattleya* came into Europe and UK on timber that was imported from South America. Botanists and plant collectors who noticed these growths on the logs in the yard, thought they were parasites and took them out and inserted them into slits cut into trees with sap hoping they would survive. But they didn't. The next stage was when some imports came into Europe and the UK, they found the crates were packed with some strange plants and moss – basically used as packing material. The material was thrown around the yards. Some days later somebody noticed that the strange plants had sprouted roots and perhaps leaves. That was when the realisation dawned that they were actually epiphytes which grew in steamy hot jungles with high rain and humidity. So they constructed glass stove houses with no ventilation to simulate the jungle conditions. Once again most of the plants died.

In the year 1817 William Swainson, a plant collector discovered a plant with lavender coloured flowers in bloom while he was exploring the steamy jungles of the province of Pernambuco in northern Brazil. On his return, Swainson presented a few of these plants to the Glasgow Botanical Garden.

At Swainson's request, the Glasgow Botanic Garden also gave some of the plants to a tropical plant enthusiast named William Cattley, who grew one in his stove house in Barnet, England in November 1818. The flowers produced by this plant were spectacular in size, shape, colour and even had a sweet fragrance. Swainson named the genus in honor of Cattley, thus the plant is named *Cattleya labiata*.

Cattleya labiata was the first of 17 large-flowering *Cattleya* species discovered by European collectors during the 1800s. It was not an easy job to find these species because they were usually hidden in high cloud forests of the Andes Mountains, sometimes in impenetrable jungles, often teaming with deadly diseases and unfriendly natives. More than one collector died in the effort.

The *Cattleya* group is known for large, showy and sometimes fragrant flowers. Some of the most stunning orchids in cultivation are the *Cattleyas*, with huge flowers that can measure between 8 to 10 inches across, and they come in a wide variety of colors and patterns. Because of their ease of growth and sheer beauty, *Cattleyas* are the most hybridized of all orchids, and today there are thousands of registered hybrids.

Cattleyas have a thick horizontal rhizomatous stem. New growth sprouts from buds along this horizontal stem, and healthy plants may grow from multiple points. Each new growth, or "lead", begins with a bud near the base of the previous growth and these new growths are called pseudobulbs, which are a storehouse of moisture and nutrients. Plants tend to grow horizontally rather than vertically, although the pseudobulbs grow upright. Most *Cattleyas* will grow out of their pots within a few years. *Cattleyas* are sympodial orchids, unlike *Vandas*, which are monopodial.

Cattleyas can be either epiphytes or lithophytes (plants which grow on chalky rocks or steep cliffs). As the pseudobulb grows, a fine covering or sheath is formed to protect the new growth from the vagaries of the weather and insects. The roots of *Cattleya* are likewise covered with a special soft tissue called 'velamen' which is an indicator for growers when the plant needs water and moisture. If the velamen is white in colour it is a sign that it could do with water; the moment you spray it with water, the root (velamen) will turn green. The flowering stalk is called a 'raceme', on which you get one to six flowers, depending on the type of *Cattleya*. The flower buds of *Cattleya* also have a sheath to protect the emerging flowers from the weather and insects.

Cattleya flower has three sepals, one dorsal and two lateral; and three petals which are broader than the sepals. One of the petals is modified to form the lip or labellum.

The lip or labellum in turn has three lobes – two lateral and one mid-lobe, which hangs down and usually displays varied colours. At the rear end of the lip is the column – a finger-like upright structure that carries the orchid's male reproductive organs, the pollen sacs (pollina), and the stigmatic surface (of the female reproductive organs) – is located under the anther cap where the pollination takes place. The pollen is transferred by ants, bees and other insects to ensure pollination. Over a period a pod forms which takes up to nine months to ripen. This pods will contain probably a few thousand seeds.

In the bud stage, the lip is the uppermost petal, but as the bud starts to open up into a flower, it twists 180* around its flower stalk to position the lip in the lower half of the flower and this process is called 'resupination'.

Light – The *Cattleya* orchids like bright light. They can even be acclimatised to some direct sunlight, although we would suggest that you keep them from direct summer sunlight. *Cattleyas* will not flower without plenty of light. In the right light conditions, the leaves will be apple green. Darker leaves might indicate too little light, while yellow or brown leaves might indicate too much direct sunlight. *Cattleyas* need abundant though not intense light in order to grow and flower well. About 2,000 - 3,000 foot-candles is satisfactory, and as with many orchids, the early morning sun is very important. An east window, or a south window with light shading such as a sheer curtain from the middle of February to the end of October is ideal.

Water – *Cattleyas* are sympodial orchids that grow from the rhizomatous horizontal stem. They typically send up new pseudobulbs in the spring. During the growing season, water heavily, but do not allow them to sit in water. Cut water back when the flowers begin to emerge from their sheaths – water in these sheaths will rot the immature flowers. A well-watered *Cattleya* will have fat lead pseudobulbs. If you water your *Cattleyas* thoroughly the roots will grow downwards, but if you only water the surface, the roots will tend to grow on the surface. How often do you water your *Cattleyas* depends on how rapidly your soil/mix dries out, It all depends on the time of the year, your own balcony/garden/terrace area. As a thumb rule I'd say mature *Cattleya* plants should be watered once in four days and young plants once every two days. The best idea is to vary the watering depending on the growing cycle of the plant – keep dry in the winter and wet in simmer months. As regards the quality of water, *Cattleyas* like a less alkaline , no chlorine water. The best is to store rain water and use it on them.

Fertilizer – During the growing season, fertilize with a weak orchid fertilizer weekly. During the rest period, fertilize every other week. We are sometimes told to water first and then feed. Think about it, this does not make sense. Orchid roots are like sponges - they take up water and when they are saturated, they will not take up any more water. If you've already saturated the roots with water, how will the roots take up any fertilizer?

Blooming – Most Cattleyas produce one new flush of growth annually, and each new pseudobulb should produce flowers in that same growing season, often in late summer or winter. Some of the hybrids might produce two blooms annually. When a plant goes into flower, reduce watering to avoid accidentally rotting the blooms.

Potting and repotting – Cattleyas grow by means of a branching, creeping rhizomatous stem with thick, clinging roots. Repotting is stressful, and a plant will usually take a season to recover, so repot only when necessary. But how do you decide when it is necessary? My belief is that the plant will itself tell you when when the plant/pseudobulbs reach the edge of the pot and start leaning over, it is time. They will do well in most orchid mixes, including bark, tree fern, clay pellets, perlite, brick or old pot pieces, charcoal, or any well-draining medium. When repotting a Cattleya, make sure there is enough room for the creeping stem to produce at least two new pseudobulbs before it hits the edge of the pot. Typically, repotting is done in spring, at the beginning of the growing season. Cattleya can also be slab-mounted on tree fern or logs, but that means daily watering in a place like Bangalore, especially during the months of February through June.

Dividing a Cattleya plant – When a plant has grown so big that it is no longer practical to repot it into a larger container, that is the time to divide your plant.

- Wet the pot, plant and media thoroughly, a couple of times to ensure that the roots are soft and will not get damaged when being pulled out of the old container;
- See which direction the plant/creeping stem is growing;
- Hold the pot with the new growth in the opposite direction and slowly ease the plant out of the pot;
- Clean the root ball and cut old roots where necessary, check to see for tell-tale signs of any pests – clean where needed;
- When you divide a plant the new plant should have at least 3 or 4 healthy pseudobulbs for the new plant to flower within the next year;
- Take a clean sterilized knife and cut the stem behind the fourth pseudobulb;
- Apply cinnamon powder at both cut ends to ensure no infection sets in;
- Place the new plant into a suitable size pot with the oldest bulb against the back of the container to ensure there is enough place for at least two or three new bulb growths;
- Firmly support the new plant in its container with a large size ladies hair pin.
- If the old mother plant has back bulbs, pull them apart and place them in sand and keep the mix slightly damp. In a couple of weeks you will see new eyes will open up.

Grower's tips – Cattleyas are not difficult plants, and their flowers are incredibly rewarding. Depending on the species, they may produce just a few showy flowers or bunches of smaller, waxy flowers. Not all Cattleya flowers are fragrant. The biggest mistake most people make with Cattleyas is not exposing the plant to enough light for it to bloom well. The second common mistake we make is overwatering the plant. Watch the pseudobulbs—a plump lead pseudobulb indicates a well-hydrated plant.

Potting media - These orchids are highly adaptable and will grow well in pots, baskets or on mounts (cork bark, driftwood, tree fern, charcoal, brick/tile pieces). They are not generally fussy about the growing medium as long as it is very open, well-aerated and free-draining. Remember, they are adapted to growing on the trees, where they are subject to heavy rains alternating with breezy, dry conditions. The plants need good air circulation around the roots. This is perhaps the most critical element in caring for Cattleyas, as the plants will not do well if their roots are soggy or in poorly-aerated potting material. Different potting materials have different characteristics, - particularly with respect to moisture retention. No one material is better than another – each has its advantages and disadvantages. Choose a medium that will be appropriate for your conditions. If you water your plants frequently, use mounts or clay pots with an extremely free-draining medium such as Hydroton (expanded clay pellets) mixed with charcoal and brick chips. If you water infrequently, choose materials that will hold moisture somewhat longer.

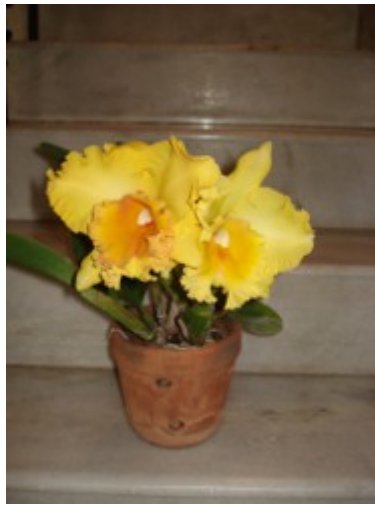
Growth cycles – Most Cattleyas have relatively distinct growing and resting phases during the annual cycle. While the plants are actively growing, they should be fed and watered regularly. I fertilize weekly during the growing season, and cut back on both fertilizer and water during the shorter, cooler days in winter. Learn to recognize the signs of growth and the signs of resting, and care for your plants according to their needs during these parts of the cycle. If they are actively growing (no matter what time of the year it is), make sure they get regular water and fertilizer. If they are not growing, cut back on both fertilizer and water until you see signs of growth again. The resting phase may last a few weeks or a few months.

Humidity – Cattleyas do best when humidity ranges from 40% to 70%. Humidity as a rule is highest at night and lowest during the peak of afternoon. Therefore, except in areas where natural humidity is quite high, or during cold, cloudy or rainy weather, it is important to add moisture to the growing environment, especially during the day. This can be accomplished in a number of ways. For small collections, humidity trays may be sufficient. These trays are nothing more than a water-holding tray filled with small aquarium gravel. You could use the trays in one of the following ways – place them directly below the benches on which your *Cattleya* pots are placed or *Cattleya* plants are placed in small saucers in the trays to ensure the roots are not submerged in water all the time, . Greenhouses should be damped down in the morning, and again during the day if necessary and possible. A mist spray of the foliage is useful in bright hot weather. In a small greenhouse this may be needed several times a day. A good humidifier, properly connected to both a humidistat and a thermostat, are necessary particularly if your greenhouse is left unattended during daylight hours. Where natural humidity is high, increased air movement is essential to prevent stagnant air and the development of diseases. In green houses install fans. In the cold winter months, the greenhouse should be drier. Reduce damping down, spraying and humidification because root rot can spread, especially in young plants.

Pests and diseases : There are many pests and diseases that can affect you Cattleyas but the most common in India, based on what I have experienced are the scale insects and the mealy bugs. Cattleyas are tough plants with a thick pseudobulb and leathery leaves which most insects avoid.

The scale insects form inside the sheath around the pseudobulbs and flower buds. So make it a practice to remove the dry sheaths from your plants every fortnight. A regular check is useful. Remember prevention is easier than cure. If there is a slight infestation wash the infected area with soap water or apply light surgical spirit using cotton buds or apply diluted rigor or malathion using an old tooth brush. So a word of caution, before adding a new plant purchased to your collection, please treat it fully after checking for any possible infestation. Mealy bugs are the other danger, although they tend to attack plants with softer tissues like *Phalaenopsis*. If they attack your Cattleyas please follow the same routine as we suggested for the white scale insects.

Fungal and bacterial infections mainly arise due to poor cultural practices. Remember fungus sets in when the temperature and moisture is conducive for the fungus/bacteria to grow. When conditions are dry spores are down, when it is wet they get active. Black rot is one of the more common infestations in India. Starts possibly when water stays on the leaf late in the evenings when the temperature drops. Correcting the environment is far easier than controlling the disease. It usually appears as black patches on the leaf and then spreads. Can be deadly and kill the plant ultimately. Cut the leaf or a part of it when you see an infection appearing. Apply fungicide or bactericide. Dust the infected area with sulphur and segregate the plant into a dry area for at least a week/fortnight.



Growing Cattleyas can be fun and rewarding, but remember it is a 'do it yourself hobby'.
You cannot delegate it to someone else.

References:

Chadwick and Sons
Iospe Photos
American Orchid Society

ಸ್ವತೋಗ್ಲೋಟಿಸ್

ನಳಿನಿ ಕೊಟ್ಟೊಳ್ಳಿ

ಸ್ವತೋಗ್ಲೋಟಿಸ್ ಪ್ಲಿಕಾಟ (Spathoglottis plicata) ಅರ್ಕಿಡ್‌ನ ಒಂದು ಪ್ರಭೇದ. ನೆಲದಲ್ಲಿ ಬೆಳೆಯುವ ಗಿಡವಾದ್ದರಿಂದ ತೋಟದ ಗಿಡ ಎಂದು ಕರೆಯುತ್ತಾರೆ. ಗಡ್ಡಗಳಿಂದ ಬೆಳೆಯುವ ಈ ಸಸ್ಯ ಅಡಿಕೆ ಎಲೆಯಂತೆ ತೆಳ್ಳನೆ ಉಬ್ಬುಗೆರೆಗಳನ್ನು ಹೊಂದಿರುತ್ತದೆ. ಗೊಂಚಲು ಹೂಗಳಿಂದ ಕೂಡಿದ್ದು ಮೊಗ್ಗುಗಳು ಕೆಳಗಿನಿಂದ ಅರಳುತ್ತಾ ಹೋಗುತ್ತವೆ. ಒಂದು ಗೊಂಚಲು ಸುಮಾರು 30-40 ದಿನ ಇರುತ್ತದೆ. ಉದು ಬಣ್ಣ (purple), ಹಳದಿ, ತಿಳಿನೇರಳೆ, ಬಿಳಿ ಹಾಗೂ ಮಿಶ್ರ ವರ್ಣದ ಹೂಗಳ ತಳಿ ಹೊಂದಿವೆ.

ಬೇರೆ ಪ್ರಭೇದದ ಅರ್ಕಿಡ್‌ಗಳಿಗಿಂತ ಸುಲಭವಾಗಿ ಇವುಗಳನ್ನು ಬೆಳೆಸಬಹುದು ಕಡಿಮೆ ಬೆಲೆಯಲ್ಲಿ ಸಿಗುವ ಈ ಅರ್ಕಿಡ್‌ಗಳನ್ನು ಹೂ ತೋಟದ ಇತರೇ ಗಿಡಗಳ ಜೊತೆಯಲ್ಲಿ ಹಾಗೂ ಕುಂಡಗಳಲ್ಲಿ ಬೆಳೆಸಬಹುದು. ಉಷ್ಣವಲಯದ ಸಸ್ಯಗಳಾದ್ದರಿಂದ ಬಿಸಿಲು ಚೆನ್ನಾಗಿ ಬೀಳುವೆಡೆ ಬೆಳೆಸಬೇಕು. ಬುಡದಲ್ಲಿ ನೀರು ನಿಲ್ಲದಂತೆ ನಿಗಾವಹಿಸಬೇಕು. ಸಸ್ಯಾಭಿವೃದ್ಧಿಯೂ ಬಹಳ ಬೇಗ ಆಗುತ್ತದೆ. ಸುತ್ತ ಬರುವ ಗೆಡ್ಡೆಗಳನ್ನು ಬಿಡಿಸಿ ಅಭಿವೃದ್ಧಿಗೊಳಿಸಬಹುದು.

ನೀರು ಬಸಿದು ಹೋಗುವ ಮಿಶ್ರಣ ಮಣ್ಣು, ಮರಳು, ಕೊಟ್ಟಿಗೆ ಗೊಬ್ಬರ ಸಮನಾಗಿ ಮಿಶ್ರಣ ಮಾಡಿ ಗಿಡಗಳ ಗೆಡ್ಡೆಗಳು ಮಣ್ಣಿನಲ್ಲಿ ಮುಚ್ಚದಂತೆ ನೆಡಬೇಕು. ವಾರಕ್ಕೊಮ್ಮೆ 20-20-20 ಎನ್. ಪಿ.ಕೆ ಅಥವಾ ಕೊಳಸಿದ ಸಗಣೆ ನೀರು, ಹಿಂಡಿ ನೀರು ಕೊಟ್ಟರೆ ಉತ್ತಮ ಹೂಗಳನ್ನು ಪಡೆಯಬಹುದು.

ತೇವಾಂಶ ಹೆಚ್ಚಾದರೆ ಎಲೆಗಳ ಹಿಂಭಾಗದಲ್ಲಿ ಹಿಟ್ಟು-ತಗಣೆಗಳ ಸಂತಾನ ಜಾಸ್ತಿ ಆಗಿ ಎಲೆ ಒಣಗಲಾರಂಬಿಸುತ್ತದೆ. ಇದರ ನಿವಾರಣೆಗೆ ಬೇವಿನ ಎಣ್ಣೆ ಅಥವಾ ಕೀಟನಾಶಕದ ಸಿಂಪರಣೆ ಸೂಕ್ತ. ಸರಿಯಾದ ನೀರು, ಗೊಬ್ಬರ, ಬೆಳಕಿನ ನಿರ್ವಹಣೆಯಿಂದ ಇಡೀ ವರ್ಷ ಹೂಗಳನ್ನು ಆನಂದಿಸಬಹುದು, ಕುಂಡದ ಗಿಡಗಳನ್ನು 2 ವರ್ಷಕ್ಕೊಮ್ಮೆ ಹೊಸ ಮಣ್ಣಿನ ಮಿಶ್ರಣದಲ್ಲಿ ನೆಡಬೇಕು.

ಸ್ವತೋಗ್ಲೋಟಿಸ್‌ನಲ್ಲಿ ಸುಮಾರು 50 ವಿಧಗಳವೆ ಮತ್ತು ಹಲವಾರು ಮಿಶ್ರತಳಿಗಳಿವೆ.

- ಸ್ವತೋಗ್ಲೋಟಿಸ್ ಪ್ಲಿಕಾಟದಲ್ಲಿ ಎಲೆಗಳು ಆಗಲವಾಗಿ ಎರಡು ಅಡಿಗಳಷ್ಟು ಉದ್ದವಾಗಿ ಉದ್ದ ಕಡ್ಡಿಗಳಲ್ಲಿ ಹೂವಾಗುತ್ತದೆ. ಒಂದೊಂದೇ ಹೂ ಕೆಳಗಿನಿಂದ ತುದಿಯವರೆಗೆ ಅರಳುತ್ತದೆ.
- ಸ್ವತೋಗ್ಲೋಟಿಸ್ ಕಿಂಬಾಲಿಯಾನದಲ್ಲಿ ಎಲೆಗಳು ಸಣ್ಣದಾಗಿ ಸಂಕೀರ್ಣವಾಗಿ ಸಣ್ಣ ಹಳದಿ ಹೂಗಳಿಂದ ಅವೃತ್ತವಾಗುತ್ತದೆ.
- ಸ್ವತೋಗ್ಲೋಟಿಸ್ ಪಾಲಿನ್ ಪ್ರಭೇದ ಗಿಡ ಗಿಡಗಳನ್ನು ಹೊಂದಿದ್ದು ಹೂ ಹೆಚ್ಚು ಎತ್ತರವಿರುವುದಿಲ್ಲ.
- ಸ್ವತೋಗ್ಲೋಟಿಸ್ ಅಫಿನ್ ಕುಬ್ಜ ಗಿಡಗಳಾಗಿ ಕುಂಡ ಕೃಷಿಗೆ ಅನುರೂಪವಾಗಿದೆ.
- ಸ್ವತೋಗ್ಲೋಟಿಸ್ ಕಾಬರಟ್ ತೀರಾ ಇತ್ತೀಚಿನ ಮಿಶ್ರತಳಿ. ಇದರಲ್ಲಿ ಮಿಶ್ರ ಬಣ್ಣಗಳೇ ಹೆಚ್ಚು, ಕೆಂಪು, ಹಳದಿ, ಬಿಳಿ.

ಹಳದಿ ಗುಲಾಬಿಯ ಮಿಶ್ರ ತಳಿಗಳನ್ನು ಕಾಣಬಹುದು.

ಸ್ವತೋಗ್ಲೋಟಿಸ್ ಹೂಗಳ ಬೀಜಗಳನ್ನು ತೆಗೆಯದೆ ಬಿಟ್ಟರೆ ಧೂಳಿನಂತಹ ಬೀಜ ಪ್ರಸರಿಸಿ ಗಿಡಗಳು ಬೆಳೆಯುತ್ತವೆ. ಬೀಜ ಬಣಗುವ ಮೊದಲು ತೆಗೆದರೆ ಹೆಚ್ಚು ಹೂಗಳನ್ನು ಪಡೆಯಬಹುದು. ಸ್ವತೋಗ್ಲೋಟಿಸ್ ಪ್ಲಿಕಾಟಕ್ಕೆ ಔಷಧೀಯ ಗುಣಗಳಿದ್ದು, ಈ ಸಸ್ಯ ಕುದಿಸಿ ತಯಾರಿಸಿದ ಕಷಾಯವನ್ನು ಸಂಧಿವಾತಕ್ಕೆ ಬಿಸಿ ಶಾಖ ಕೊಡಲು ಉಪಯೋಗಿಸುತ್ತಾರೆ.



Orchid Breeding in India : Miles to Go

Dr. Sadanand Hegde

Introduction

India is known for its rich biodiversity. Therefore, it is recognised as one of the “Mega Biodiversity” regions in the world. One of the important components of the plant biodiversity is “ORCHIDS” – a unique group of plants belonging to the family Orchidaceae known for its lovely long lasting blooms in various colour combinations beholding the onlookers. Today, orchids are one of the important commercial crops commanding multimillion dollar business world over.

Although Indians knew about orchids as plants of ornamentation and medicinal importance, their potential in floriculture is realized only in the recent years when cut flowers and pot plants of orchids started flooding the Indian markets. However, it is pertinent to note that these orchids have undergone several generations of transformation by way of breeding, selection and improvement in the quality of flowers and longevity of blooms suiting to the market demand. Over the last one and a half century, a number of Indian orchid species have been collected and used in breeding and production of latest hybrids of commerce elsewhere in the world. India has miserably lagged behind in orchid breeding in spite of its rich orchid resource – 1,350 species in 186 genera. An overview of the orchid breeding in India has been presented in this paper.

Retrospect

When one looks back at the history of Orchid development, orchid growing which was a hobby of the royals and affluent people in Western countries has today become an industry of cut flowers and pot plants of multimillion dollar business world over. Production of the first orchid hybrid, *Calanthe Dominyi*, a cross between *C. masuca* and *C. furcata*, in the year 1856 in London, is an important milestone in this direction that opened up tremendous possibilities of orchid breeding (Hegde 1984). It is followed by the production of the first *Paphiopedilum* hybrid P. ‘Harissianum’ a cross between *P. barbatum* x *P. villosum* bred by James Dominy and registered in 1869. Interest in breeding gradually picked up in other ornamental genera like *Brassavola*, *Cattleya*, *Epidendrum*, *Laelia*, *Saphronites*, so on by many hobbyists and nursery men around the world. By 1890, some of these hybrids became available for the growers. However, there were constraints faced by breeders in seed germination and subsequent growth and development until flowering stage. Only very few seeds out of many sown at the base of the plant would germinate with poor survival rate; besides, time taken for blooming was also considerably long. While Royal Horticulture Society, London played an important role in popularising orchid growing, breeding and evolving a registration process of Orchid hybrids, Singapore Botanic Garden pioneered in producing tropical Orchid hybrids.

In 1922, Knudson developed a technique of producing plants from seeds through aseptic culture in the laboratory without mycorrhiza. This is another important milestone in facilitating orchid breeding. Subsequent discovery of meristem culture by G. M. Morel in 1956 revolutionized orchid industry both in terms of quality and quantity production of commercial hybrids. Today, there are more than 1, 25, 000 manmade registered orchid hybrids, leading to a vibrant Orchid Industry in the world. Recent discoveries and modern biotechnological approaches of micro propagation, mutation breeding, transgenic varieties (Masahiri 2011, Murthy et al 2009, Wong 2011) have added dimension to the Orchid Industry introducing an array of newer hybrids and

clones released to the market making it more competitive in the world floriculture (Hegde 2011, Murthy, et al. 2009). Today, orchids command top position in floriculture and are grown both for cut flowers and pot plants for their exquisite colour combinations, shapes and long vase life/plant life. However, India is still in its infancy with hardly about 100 orchid hybrids registered so far and in adopting modern technologies in orchid growing.

By the time India realised the importance of orchids in floriculture, Orchid Industry elsewhere in the world has progressed tremendously by adopting biotechnological means to improve the quality and quantity of production of flowers which are of hybrid origin and genetically modified to suit the ever increasing demand (Hegde 2014). At the same time, there has been increasing awareness on the depleting natural population of orchid genetic resources warranting immediate conservation measures (Hegde 2000, 2001). Under the prevailing circumstances, India had to depend upon other advanced countries both for technology and planting materials to develop orchid based floriculture.

Government Initiatives

Accordingly, Government of India took initiatives to promote orchids through various agencies like National Horticulture Board (NHB), Agricultural Produce Export Development authority (APEDA), NABARD, besides promoting conservation, research and development through, MOEF, ICAR, DBT, Department of Science & Technology (DST), etc. For the last fifty years emphasis has been given for research and sustainable development of orchids ensuring conservation of native species and developing this resource for commercial purpose through breeding, culture and farming of commercial varieties (Hegde 2001). Efforts have been made to involve local communities in growing orchids supplementing their economy (Hegde 1999). Sikkim, Darjeeling, Kalimpong, West Bengal, N.E. States, Kerala, Karnataka, parts of Maharashtra (Pune), Tamil Nadu (Nilgiris) and some States of W. Himalayas of North India have been found ideal places for growing of orchids suiting to the agro climatic situations.

In India floriculture is considered as “Sunrise Industry” and has 100% export oriented status. It has emerged as hi-tech activity taking place under controlled green house conditions. Liberalisation of Industrial and Trade Policies have paved a way for export oriented production of cut flowers. New Seed Policy has enabled importation of planting materials easier to promote orchid based floriculture in India.

Orchid Germplasm: Native Species

With the above mentioned initiatives, today, we have good germplasm collection of indigenous and exotic species, besides exotic hybrids in India to undertake production of new novel hybrids. Out of about 1350 native species, at least 200 species belonging to the genera *Aerides*, *Arachnis*, *Cymbidium*, *Calanthe*, *Dendrobium*, *Papilionanthe*, *Paphiopedilum*, *Phaius*, *Phalaenopsis*, *Renanthera*, *Spathoglottis*, *Vanda* etc, are ornamentals which can be utilized for breeding and plant improvement (Hegde 1984, 1997).

In this direction, there has been consistent efforts in India for evolving indigenous hybrids in various centres (NRCO, Sikkim; SFRI, Arunachal Pradesh; TBGRI Trivandrum; Centre for Orchid Gene Conservation of Eastern Himalayan Region, Manipur; U.C. Pradhan Orchid Lab, Kalimpong; Ganesh Mani Pradhan, Keshav Pradhan, etc) for the last fifty years (Hegde 2001, Sathish Kumar 2008, Kishor 2011, UC Pradhan 2014). To name a few:

1. *Renanthera imschootiana* x *Aerides rosea* = *Renades* “Arunodaya” Registered in 1991; Hegde (2001).
2. *Paphiopedilum druryii* x *P. sukhakuli* = *Paphiopedilum* “Sukhadru” by UC Pradhan.
3. *Phalaenopsis manni* x *Paph. taenialis* = *Phalaenopsis* “Dr. Indra Bahadur Rai” by U C Pradhan, 2014 (personal communication).
4. *Paphiopedilum exul* x *P. druryii* = *Paphiopedilum* MS Valiathan by Sathish Kumar 2008.
5. *Renanthera imschootiana* x *Vanda stangeana* = *Renanthanda* Momon Shija by Raj Kumar Kishor 2008.

Indian Orchid Hybrids



Attempts have also been made to cross exotic species and hybrids with indigenous species. In all, there are about 100 registered hybrids from India so far.

Exotic Species & Hybrids

However, it is seen that further improvement of these hybrids is required for commercial production and competing in world floriculture market. In order to pick up with the modern trends in orchid breeding and production of quality cut flowers and plants, it is essential to import germplasm and planting materials from abroad, especially from advanced countries like Holland, Thailand, Malaysia, Singapore, Australia, New Zealand, USA and Taiwan.

Some of the exotic orchids (hybrids & species) imported for the last several years and presently grown in India are: *Arachnis* Maggie Oei, *Aranda*, *Aranthera*, *Ascocenda*, *Brasavola*, *Brasavolacattleya*, *Cymbidium* hybrids: Alexanderi ‘Westonbirt’, Borrough Green ‘Opal’, Jungfrou

'Dos Peublos', Camales, Show girl 'Cooksbridge', *Okney* Pink Heather, *Rievaux* x *Cooksbridge*, *Rotoura* 'Rose', *Angelica* December Gold, *Hautescens*, etc, *Dendrobium* hybrids: White – Pure white 4N, Jack Dorean, Aliga, Blushing, etc, Light Pink :Anna, Sakura, Dark Pink: Sonia, *Deang siam*, Nia rose, Pompadour, etc, Yellow: Jade, Fatima, Mary Mark, Blueberry: Bicoloured: Candy Strike, Mary Trousse (Green), etc., *Eunanthe sanderiana* (*V. sanderiana*), *Laeliocattleya* (*Lalia* x *Cattleya*), *Mokara* (*Arachnis* x *Ascocentrum* x *Vanda*)- Kelvin, *Zaleha Alsagof*, etc. *Laelia anceps*, *goldiana*, *harpophylla*, *Oncidium* species: *splendidum*, *ampliatum*, *stipitatum*, *papillio* (*Psychopsis picta*), *Laeliocattleya*, *Paphiopedilum* species: *belatulum*, *callosum*, *charlesworthii*, *concolor*, *sukhakulii*, etc., and their hybrids: Wisnston Churchil, *Hodefroye*, etc, *Phalaenopsis* species: *amabilis*, *amboinensis*, *intermedia*, *luddemaniana*, *sanderiana* etc., Hybrids: Barbera Bush, Redfan 'Grazia', Antonio, etc, *Potinara* (*Brassovola* x *Laelia* x *Cattleya* x *sophrinitis*), *Renanthera storiei*, *R. coccinia*, *Rhynchostylis gigantea*, *Spathoglottis* Premier(pink), Tamasek Park(yellow), *Vanoverberghii*(yellow), *Rhynchocattleya*, *Vanda* species: *coerulea* (Thai var), *rothschildiana*, *lamellate*, Hybrids: *Rothschildiana* 'Sally Roth', Gordon Dillon 'Lea', etc, *Zygopetalum*, and so on.

While some of these hybrids like *Arachnis Meggie Oei*, *Paphiopedilum Winston Churchil*, *Hodefroye*, etc are primary hybrids of yester years, *Aranda*, *Potinara*, *Laeliocattleya*, *Rhynchocattleya*, etc are multi generic complex hybrids. On the other hand, *Cymbidium*, *Dendrobium* and *Paphiopedilum* clones (Hegde 2006, 2009) are complex inter specific hybrids. *Cymbidiums* are essentially temperate in nature (1999), while *Vandas* are tropical and excellent germplasm breeding materials (Motes 2011). Hence, there is a need to carefully plan the breeding program noting environmental requirements of species/hybrids that one intends to cross and develop a hybrid. Knowledge of genetic variability and compatibility of the parental species/hybrid is essential along with family tree of the complex hybrids to plan a breeding program. Hence, the breeders in the research organizations and the hobbyists must undertake breeding with all the background information of the parental species with a market driven approach for the production of newer hybrids adopting modern technology (Wong 2011). The objective and focus of breeding must be on quality production of hybrid varieties at a reasonable cost and make it available to the communities both at rural and urban levels in suitable agro climatic zones. This would help develop a hub of activities right from farm gate to the market places in cities.

Conclusion

Although efforts are on, India is yet to make any headway in developing Orchid Industry. We are half a century behind the advanced countries as far as orchid breeding is concerned. Crux of the problem is lack of production of indigenous hybrids matching the modern day orchid hybrids of commerce adopting the biotechnological approaches. Research Institutions and Orchid Societies in India will have to take a lead in this direction utilizing our orchid genetic resources and by imparting training to farmers, women's groups, unemployed youths and hobbyists in breeding and cultivation of orchids to achieve development of Orchid Industry in India. We have a long way to tread; miles to go to achieve this objective.

References

- Hegde, S.N. 1984. Orchids of Arunachal Pradesh. Arunachal Pradesh, Itanagar.
 _____ . 1997. Orchid Wealth of India. Proc. Indian Natn. Sci. Acad. B63 No. 3 pp 229-244.
 _____ . 1999. *Cymbidiums*: Cultivation Technique and Trade. SFRI Bulletin No.8. Itanagar.
 _____ . 2000. Orchids of North-east India: Conservation and Export Potential. In: Natural Resources Conservation and Management for Mountain Development. (Eds. S.C.

- Tiwari & P. P. Dabral): 91 -154.
- _____. 2001. ORCHIDS: Conservation, Cultivation, Farming and Trade. OSA, Himalayan Publishers, Itanagar.
- _____. 2006. Prospects of Orchid Trade Industry in Karnataka. Orchid Newsletter, 1.1:10-16.
- _____. 2009. Cultivation and Farming of Selected Orchids for Trade. In: Proc. National Conference on Orchid Genetic Diversity. Pp. 52 – 61, Thane.
- _____. 2011. Involvement of Communities in Rural and Urban Areas for the Development of Orchid Industry in India. In: Proceedings of the National Seminar on Orchids, Alahabad.
- Kishor, R. 2011. Versatility of *Renanthera imschootiana* Rolfe, a Rare & Endangered Orchid, as a potential Parent in Breeding of Vandaceous Hybrids. In Proc. 20th WOC, Singapore. Pp. 71.
- Martin Motes. 2011. Future Vanda Breeding. In Proc. 20th WOC, Singapore. Pp. 67.
- Masahiri MII. 2011. Biotechnology of Orchids: A Brief Review of Genetic Transformation and Protoplast Fusion in Orchids. In. Proc. 20th WOC, Singapore. Pp. 34.
- Murthy H. N., Y. J. Yoon and K. Y. Paek. 2009. . In: Proc. National Conference on Orchid Genetic Diversity. Pp. 50-51. B. N. Bandodkar College of Science, Thane.
- Sathish Kumar C. 2008. Orchids of Thailand and Singapore: Lessons from two Strong Friends. Proc. National Conference on Orchids: Science & Society. Bangalore. Pp. 94.
- Wong S. M., 2011. Application of New Technologies to improve Orchid Varieties. In Proc. 20th WOC, Singapore. Pp. 38.

Orchid Scenario in India

K. S. Shashidhar, Ph.D

India with a total land mass of about 329 million hectares has highly diverse geographical and climatic conditions occurring throughout its length and breadth. It is also interesting to note that diverse ecological habitats are distributed over wide range of latitudes and altitudes making it one of the most exciting areas from botanists view. With its tropical climate, India has different rainfall and temperature zones ranging from less than 50 cm to more than 250 cm of rainfall annually. Vast majority of Indian orchids are distributed in the mountainous regions although some of them are in plains. All these variations make an ideal natural habitat for as many as 1600 species of some of the well known terrestrial, epiphytic and saprophytic orchids. The great Himalayas forming a boundary in the North and North East, the Patkai range in North Eastern part, Aravallis in Western India, Western and the Eastern Ghats along the Peninsula, Vindhya and Satpuras in Central India, form the mountainous areas and important orchid zones of the country. The plains of Assam and the foot hills of Arunachal Pradesh also form important habitats for orchids.

The Himalayan region especially Eastern Himalayas houses some of the most beautiful Vandas, Dendrobiums, Cymbidiums and Coelogynes. Of the 1600 orchid species occurring in India, almost 800 species are found in North East. The state of Arunachal Pradesh has as many as 425 species and Sikkim about 500 species. The beautiful ground orchids such as *Anoectochilus sikkimensis* and *A. brevilabris* are from this area. The area is also known for the Indian slipper orchids and some of the best *Aerides* species and *Renanthera*. While most of the epiphytes are concentrated in Eastern Himalayas and Western Ghats, Western Himalayas have predominantly terrestrials. The state of Uttarakhand has been reported to have about 240 species.

The Western Ghats region has almost 300 species of both terrestrial and epiphytic orchids – *Pectilis gigantea* being one of the most beautiful and large flowered terrestrial orchids. The largest terrestrial genus *Habenaria* is also found in this region. The Silent Valley area and the Agasthya Malai hills are known for orchid flora with the later being the natural habitat for the famous *Paphiopedilum druyri* which is endemic to that area.

Among the Indian species which have attracted both the commercial growers, breeders and the hobbyists are also the ones with high ornamental value. *Aerides* genus with some of the most beautiful species such as *A. multiflora*, *A. crispa* and *A. odorata* are well known. Some of the most intriguing Bulbophyllums including the *Bulbophyllum leopardianum* and *B. rothschildianum* are exquisite. All these are outdone by the diversity in the genus *Dendrobium*. This genus has some of the most fascinating flowers extensively used in hybridisation. *D. nobile*, *D. densiflorum*, *D. farmeri*, and *D. jerdonianum* are some of them. The azure blue Vanda (*Vanda coerulea*) is an eye catching species with wide distribution in North Eastern India. Complimenting this is another endangered species – *Renanthera imschootiana* has its home in North East parts.

This diversity and richness of orchid flora is subjected to tremendous anthropogenic pressures in the form of various developmental activities resulting in loss of habitat, fragmentation of habitat, loss of associated flora and fauna, especially the insects. In addition, because of its aesthetic beauty and ornamental value several orchids are subjected to over-collection as they command a high price. Eventually all these have resulted in the depletion of orchid habitat and also loss of several species.

Efforts are on to educate and create awareness among the general public about the role and

importance of orchids in maintaining the health of the ecosystem apart from its aesthetic value. Several forest areas are declared as 'Protected Areas' which has helped in protecting some of the species. But identifying the orchid rich areas and declaring these as 'Orchid Sanctuaries' is an important step for *in situ* conservation of orchids. Some of the orchid rich areas such as Arunachal Pradesh and Sikkim have been declared as Orchid Sanctuaries. To compliment this effort, several institutions such as Orchid Research Centres and Botanical gardens are engaged in *ex situ* conservation. Few such centres in states of Sikkim, Yercaud in Tamil Nadu, and Shillong in Meghalaya have been established. To create awareness about orchids several societies and NGO's such as The Orchid Society of Karnataka in Bangalore are actively engaged. However, the right direction would be to have an overall perspective and approach for *in situ* conservation of orchids and its habitat rather than an ad hoc one.

Reference

- Rao. G.R., Graceful Orchids
www.ces.iisc.ernet.in/biodiversity/sahyadri_eneews/.../article1.htm
- Shashidhar K.S., 2012. Beginners Guide to grow orchids. Pub: International Book Distributors, Dehradun, India

Orchid Events - Field Trip to Turahalli

Srikanth Parthasarathy

A short field trip invite was sent to all the society members sometime during the first week of September scheduled for the weekend. It was much exciting to see the invitation given the fact that we hardly have any nearby places to visit to see orchids growing in the wild. Very few members accepted the invitation and all of us hoped to see some orchid blooms over the weekend. Executive Committee member Raveendra Bhat was the one who organized the event and he also sent us the trip details, where to reach, dos and don'ts a few days prior to the event.

Turahalli is a small hillock which is around 10 kms away from Bengaluru. Perhaps this place is the last green lung space left in Bengaluru given the real estate and other development activities eating away all the available green space.

All of us were scheduled to meet at 7.30 am at a common point and proceed from there further. It was interesting to see only 3 people showing up for the event. Four of us reached the place by 8.30 am and started hiking from the base. It was a gradual climb and the weather was just perfect for the field trip.

We were delighted to see *Habenaria roxburghii* in bloom and we could spot at least 12-15 healthy plants in its natural habitat. We photographed the flowers and after a few trails we headed back to the base and dispersed from there.

Habenaria

Habenaria takes the name from Latin for rein or strap referring to the strap like spur. This genus of terrestrial orchids is one of the genera having largest number of species.

Habenaria roxburghii Nicolson.

Named after William Roxburgh, a Scottish surgeon and botanist, this terrestrial orchid species usually blooms in the months of August-September. White colored flowers, with the plant growing up to 12-15 inches with 2-3 leaves that usually appear before flowering and disappear after flowering till the next season. They usually are habituated to grassy slopes of hillocks.



Exhibition on ‘Insects and Orchids’, Chitra Kala Parishat, Bengaluru

Srikanth Parthasarathy

On the occasion of Late Poornachandra Tejaswi’s 75th birthday, a photography exhibition with theme on “Insects and Orchids” was organized at Chitra Kala Parishat from 8th September to 14th September 2014 in Bengaluru. The orchid photographs exhibited were contributed by our society President Dr. K.S Shashidhar. A number of Insect Photographers had exhibited macro photographs of a variety of Insects. They had displayed more than 50 photographs of orchid species from Western Ghats and North East. It was great to see some brilliant photographs of both Orchids and Insects. Insects section took us deep into the macro world of insects. It was a delightful experience for sure. A glimpse of the exhibition through these photographs below:



