



# TOSKAR NEWSLETTER

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THE ORCHID SOCIETY OF KARNATAKA  
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## TOSKAR NEWSLETTER

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#### Front cover –

*Bulbophyllum annandalei* Ridl.  
by Dr K. S. Shashidhar

### *From the Editor's Desk*

21<sup>st</sup> March 2018

It is spring and summer time and happy time for the orchids as well as for the growers as there will be plenty of blooms all round. The *Dendrobium* and other species have started putting out blooms. It is lovely to watch the timing of the blooms of *Dendrobiums* from North East. Starting from *Dendrobium heterocarpum*, *D. primulinum*, *D. farmeri* and now *D. parishii* is ready. In few places even, *D. chryosotoxum* is already bloomed. I am still waiting for that as well as for *D. crystallinum* and *D. bensoniae*.

Looking at the last Bi Monthly meeting and the AGM of the society, it was heartening to note that the display was like a mini show! Thanks to all the members who actively took part in displaying the blooming orchids. Month after month and year after year the quality of the blooms displayed by the members is improving and that speaks volumes of the efforts of the members and also the ideal platform provided by TOSKAR. Once again congratulations for all the members for these wonderful displays.

But still I urge and request two things from the members, one is whatever you are doing is fantastic and the result is seen through the lovely blooms you are getting and why not share some of the things you do to get these results?, After all TOSKAR is providing the platform for this very purpose, we will help you in that, if you need. Second is penning a small note or an article (need not be scientific) on whatever you feel about orchids. I am finding it difficult even to get few articles in a quarter, this will help me to bring out the newsletter in a much better fashion and also timely.

We made our best efforts to put few articles in this issue. Starting with Sriram Kumar's on variations in *Vanda tessellata* makes an interesting reading. As floral polymorphism in orchids is common in orchids with a high variation in floral characters and this trait is generally associated pollinators. Article by Dr. Hegde gives an overall scenario of orchid industry in India. Beginning with orchid development in India along with commercial potentials and market specification and requirements in trade of orchids. Another two articles by Dr. Shashidhar, one narrating the tales regarding the

extent people go to procure orchids and maintain the secrecy about their collection from the excerpts of book entitled Orchid Fever by Eric Hansen. Another one highlighting the relationship of orchids and pollinators as they have almost evolved together and the relationship in the ecosystem.

As most of the orchids are in bloom and many of them have started putting out new growth, this is also time for repotting and giving it better conditions to grow. Only repot those which have completed their blooms.

***For when a man falls in love with orchids, he will do anything to possess the one he wants. It 's like chasing a green eyed woman or taking cocaine ....it's a sort of madness....." - Norm MacDonald***

Dr. K. S. Shashidhar  
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## ***This issue contains...***

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# ***Vanda tessellata* - Colors of Sub-Continent**

Sriram Kumar

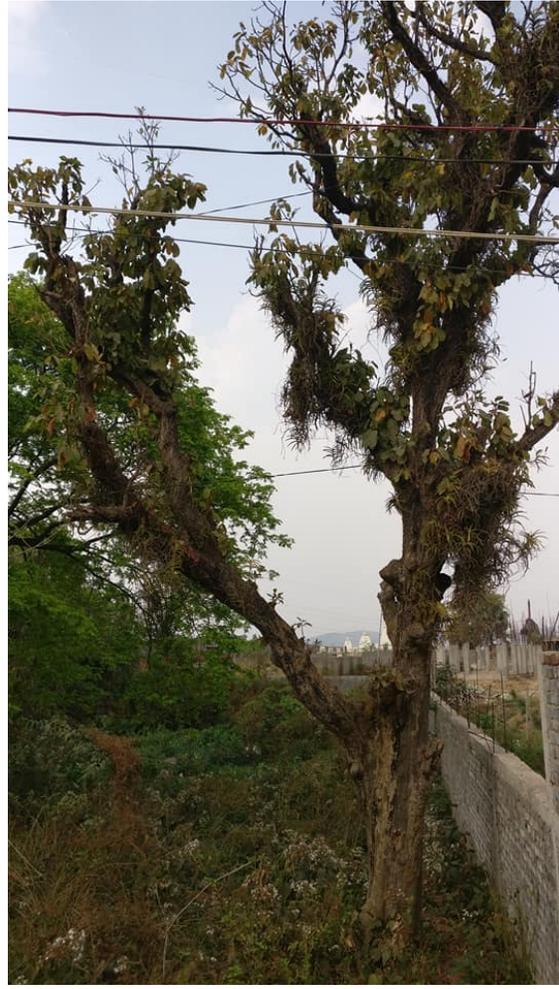
**Abstract:** fragrance, tessellation and shape are desired characters in a hybrid and one such species used extensively in Vanda hybrids is *Vanda tessellata*. Species is variable in wild with almost 50 colored forms. This article intends to profile some of the variations noticed in collection.

**Introduction:** Polymorphism in floral signals is quite common in orchids and the key role of insects through pollinator - mediated selection is one of the reasons for this. Pollinators use diverse signals through flower color, odor, size and shape and detect the flowers. Each species has preference to a specific pollinator and they generally co evolve together. Color variants in populations such as alba, semi alba, coerulea and others are normally being a result of isolation of population and in breeding. Some of those traits are exhibited in these populations which otherwise does not get expressed. This could be due to in breeding. Many of these color variants may have a different growth rate and performance.

**Presentation of the species:** Medium to large sized epiphyte found in almost entire sub continent at various elevations. Extremely hardy plant that can withstand 40+ degrees Celsius of scorching summer heat in plains of subcontinent but does not like temperatures below 15 degrees Celsius. *Vanda tessellate* has the habit of blooming when there is rain interspersed with sunshine. It blooms just before the monsoons from March to June and again from August through to December. In culture they will bloom as long as they get enough water when there is sunshine

**Blooming season: Summer.** March-September. Well-grown plants can bloom upto 4-5 times a year.

*In situ* pictures (Growing in a tree in city limits of Jamshedpur)



## Exceptional Contribution of *Vanda tessellata* in hybridization

*Vanda tessellata* is extensively used in hybrids imparting its tessellation, fragrance and vigor to its hybrids.

### Clues for Species Identification



Clue 1:

The tip of the lip needs to have 2 lobes, which should be fleshy.



Clue 2:

The side lobes need to be curved with a sharp tip. Viewed from the side the lip is quite thick and should not have a flattened appearance



Clue 3:

Inside of the lip has a W like signature.

## Variations in Color

This species is very well known for its colour variations. Over 50 shades in green, yellow, blue etc. were recorded (Jayaweera, 1981). In my opinion, *Vanda tessellata* stands out as Vandaceous orchid that has maximum natural variations in wild. Captured here are about 25 different shades grown in cultivation.

### Blue Lip Forms





**Red Lip Forms**



**flava form (Albino)**



**Semi Alba (Pink lip)**



Photo Credits: Thanks to following people for contributing to pictures

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# **AN OVER VIEW OF ORCHID INDUSTRY IN INDIA\***

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## **INTRODUCTION**

Over the last half a century, Floriculture has emerged as an export oriented multibillion dollar business globally. It mainly involves cut flowers, pot plants, cut foliage, bulbs, tubers, seeds, rooted cuttings, TC flasks and dry flowers & leaves. It has been observed that production and trade of floricultural crops has ever increasing trend. In the International trade, major crops involved are: Alstroemeria, carnations, chrysanthemums, gerbera, gladiolus, gypsophila, anthuriums, lilies, roses, tulips and of course orchids (Arandas, Cattleyas, Cymbidiums, Dendrobiums, Oncidiums, Paphiopedilums, Phalaenopsis, Vandas etc.). Orchids command high value and great in demand in the World Flower Trade. It is mainly because of attractive flower shape, size, colour and long shelf-life of cut flowers and pot plants of orchids. Out of about US \$21 billion floriculture trade, 8% is that of orchids and has an increasing trend of 15% annually (Singh 2011, Hegde 2016). It is significant to note that Netherlands is the world's leading flower producer and exporter supplies more than 170,000 tons of flowers to Germany. The Dutch control the world export and auctioning of floricultural produces. Major consumers of floriculture products are Japan, European countries, South Korea, Thailand, Indonesia and Pacific countries with ever increasing demand. Major exporters of floriculture products are Holland, Columbia, Israel, Italy, Spain, Thailand, France, the USA, South America, New Zealand, Ecuador, etc. Orchids have gained importance as one of the highly priced floricultural crops across the world.

## **INDIAN SCENE**

India is one of the orchid rich countries in the world with about 1350 species occurring in diverse phytogeographical conditions from warm coastal regions to the cool Himalayan ranges providing tropical, subtropical and temperate conditions with varying microclimates giving rise to rich bio-diversity. Such a natural situation is congenial to grow commercial varieties of orchids to feed the world market. However, despite the rich natural occurrence and ideal agro climatic conditions in India, orchid based Floriculture have not been systematically developed and the people are yet to reap the benefit out of this natural resource. Important floriculture

crops in India are amaryllis, anthuriums, carnation, chrysanthemum, gladiolus, jasmine, marigold, petunias, roses, and of course, orchids. Total acreage of these crops is about 73, 619 ha with 34, 349 tons of loose flowers and 49, 366 cut flowers. Orchids have the least production area and minimum contribution in the overall turnover of floriculture products. In fact, India has lagged other countries in Orchid trade despite its rich natural resources, ideal agro-climate and technical knowhow. Out of about Rs.500 crore businesses in floriculture industry in India, orchids have the least contribution in our country.

### **ORCHID DEVELOPMENT IN INDIA**

In India, for the first time, Hooker (1890) brought out “Flora of British India” describing 1200 species unravelling the richness of orchids in this country. Subsequent workers added number of species and today we are a proud nation with about 1350 species in about 185 genera of orchids known in our country (Hegde 2014, Jain Mehrotra 1984; Misra 2007; Rao 2014). Out of them as many as 150 species are highly ornamental, about 55 species are medicinally important and others are biological curiosities with ecological significance (Hegde 1997; Vij 2001).

Realising the importance of orchids in floriculture especially that of the hybrid varieties developed from the native ornamental species from India and other parts of the world, Government of India initiated developmental programs through various government and non-government agencies to ensure conservation of native germplasm both *in situ* and *ex situ*, and promoting sustainable development of Orchid industry through Research & Development programs through ICAR, Universities and State & Central government Agencies (Hegde 2012, 2014). Many private players viz. U.C.Pradhan Laboratories, Kalimpong, Indo-American Hybrid Seeds, Bangalore, A.V.Thomas & Co, Kerala, are also involved in production of plantings materials adopting tissue culture & modern biotechnological approaches and trade of planting materials. National Horticulture Board, NABARD & APEDA have been supporting entrepreneurs to undertake export oriented orchid trade. Some NGO activities to promote research & development and creating awareness has also been undertaken by TOSI, OSA, TOSKAR and other Floriculture Societies in various parts of India.

Meanwhile, orchid growing as a hobby elsewhere in the world has transformed itself as a vibrant floriculture industry of commerce with multi-million-dollar business of plants and cut-flower trade. Discovery of aseptic culture of seeds by Knudson (1946) and Vacin & Went (1949) and meristem culture by Morel (1960, 1964) revolutionized orchid Industry elsewhere in the world with an array of orchid hybrids and cut-flower varieties grown in modern climate controlled poly-houses. Over the last 50 years, tissue culture technology has added dimension to the industry both in terms of quality and quantity. There are over 1, 25, 000 manmade hybrids besides about 25, 000 species world over making it highly specialized, and

competitive, vibrant industry of commerce. With the modern biotechnological approaches, it has become possible to produce an array of hybrids and newer clones released to the market – specializing in flower decorations, corsages, bouquet making, pot plants with amazing colour of flowers of orchids, besides various social functions (Pathak, et al. 2001; Hegde 2001,2006,2009; Vij 2001).

It is worthy to note, India so far could produce & register hardly about 200 Orchid hybrids (Pradhan UC, 2017) which needs to be accelerated to compete in the world market. Meanwhile however, our expertise in biotechnological approach have contributed in producing tissue cultured true-to type hybrid clones which needs to be commercially exploited.

### **COMMERCIAL POTENTIALS**

Commercial potentials of orchids in India or its strength in orchid development & trade lies in: 1. Rich orchid diversity/germplasm; 2. Varying and ideal agro climate from tropical to temperate regions to grow varieties of orchids; 3. technical knowhow of Orchid growing, propagation technique, biotechnological backing, green house technology; 4. Cheap labour; 5. ever growing high end consumer market

On the other hand, our weaknesses are: 1. Lack of quality planting materials in adequate quantity; 2. lack of market driven approach in the production of plants & flowers adopting modern technologies; 3. lack of production of our own hybrids that can compete in world market; 4. lack of consistent R & D back up with new hybrid varieties & technical innovations; 5. lack of production of planting material; 6. Lack of quality and quantity of cut flowers to feed the market; 7. Lack of Training & extension programs; 8. Lack of Involvement of communities both at rural and urban levels in suitable agro climatic zones and develop hub of activities leading to market places.

### **AGROCLIMATE AND ORCHID GERmplASM**

Agro climatically, we have mainly three broad climatic zones: i. tropical; ii. sub-tropical and iii. Temperate for growing orchids. Depending upon rain pattern, humidity, temperature, elevation there exists varying types of micro climatic conditions. This has in fact given rise to orchid diversity with about 1, 350 species in 185 genera occurring in their natural habitats of our country. About 200 species of them are ornamental which could serve as germplasm for breeding, cultivation/farming and production of quality planting materials in the respective agro climatic zones (Hegde, 2001, Pathak, *et al.* 2001). Besides, over the last 50 years, large number of exotic species & hybrids have been imported & grown in various Institutions and by individual hobbyists. This is indeed our strength and potential that should be sustainably utilized for developing orchid industry (Hegde 2014). It is important to note, humidity ranging between 50 to 80% is a common

requirement for all types of orchids. Light regime of 3000 – 6000-foot candle (30000 to 60000 lux) is considered ideal.

It is worthy to note that large numbers of Indian species have been used in developing modern day hybrids elsewhere in the world. Hence, what we need now is intensive breeding program on selected orchid genera making use of wild varieties and their modern hybrids. Germplasm of most of the modern-day hybrids are now available in India which could be utilized in breeding program.

Thus, India with its varied agro-climatic zones from tropical conditions of peninsular India to subtropical and temperate areas of the Himalayas offers wonderful opportunity to grow varieties of orchids round the year. Gangtok in Sikkim, Kalimpong in West Bengal, N.E. States, Kerala, Goa, western parts of Karnataka & Maharashtra (Pune), eastern parts of Tamil Nadu (Nilgiri), Andhra & Orissa and some parts of North India are the ideal places for growing various types of Orchids. Native ornamental species and exotic hybrids should be improved through intensive breeding adopting modern biotechnological approaches. Besides, cheap labour and ever growing high end consumer market make it highly profitable proposition to grow various Orchids in India in a profitable manner (Hegde 2014).

At present in India, orchids are grown either as hobby or as a commercial enterprise. Hobbyists tend to grow varieties of orchid hybrids and species in the available space around the house or balcony. Commercial cultivation of orchids requires more space and perfection adopting the modern biotechnological approaches for producing quality plants and cut flowers in good quantity aiming at the market. The approach here should be market driven.

Modern floriculture is an integrated technology based on biological sciences making use of hardware engineering mechanisms. Understanding of genetics and physiological requirements of a crop is essential to meet the stringent requirements in the quality of cut-flowers to match the market demands. Hence, right from seed production, quality seedling production (through seeds or tissue culture), transplanting to farm houses, growing them to flower as per the requirement, harvesting and up to transportation to the market, everything at every stage biological principles are employed in achieving perfection. Accordingly, the tissue-culture lab, hardening unit, farm-houses, post-harvest packing and packaging requires hardware engineering to achieve this perfection in floriculture industry. Breeding must be a continuous endeavor applying modern biotechnological tools coupled with micro propagation of selected clones to finally meet market demand, which is ever changing with occasions and trend (Table 2).

**Table. Market specification and technological requirement in orchid trade.**

SL no.	Quality specification	Requirements of the plant	Technological makeup
1.	Preference of color shape and size is very specific and is subject to change with time	These are genetic characters of the plant. Breeding new varieties should be continuous	Select the current varieties. Replace plants at every 4-5 years' interval with upcoming varieties.
2.	Strong straight spike	Plants should be healthy and must produce limited numbers of flowers.	Proper nutritional management. Regulation of flowering beyond the optimum limit.
3.	Flowers fully open, free from blemish, clear color, broad strong petals each flower facing the same side	Plants should be healthy and must produce only limited number of flowers. Distribution of sunlight should be uniform. Direct rainfall on plants and flower to be avoided.	Proper nutritional management. Regulation of flowering, perfect layout in the North to south direction, appropriate shade, rain protection either with UVR film or Netlons.
4.	No sign of insect damage or any diseases. At the same time insecticides and other chemicals should not adhere to the flowers.	Prevent entry of insects. Maintain proper pH of the medium. Prevent growth of algae. Assure drainage. Ensure mild breeze 200M/H all the time.	Green house cultivation can prevent entry of insects. Follow integrated pest managements. Use proper size of the pot, repot timely. Use proper ratio in planting medium. Install proper ventilation device or adjust the layout with wind direction.

**Green house technology** is the latest trend and is most desired for export production with the required quality, quantity and regularity. In this regard, Government of India's initiative to adopt plastics in agriculture has yielded considerable progress in augmenting floriculture. This is required to be modified and adopted to various agro climatic zones, depending upon the crop (Singh and Dadlani, 2000). There are specialized companies who manufacture modern environment controlled green houses to suit the need of the crop. In India at present, most of the commercial labs have started tie up/joint venture programs with leading companies like BV, Florist (Holland) and others from South East Asia

and procure latest varieties to grow in India. In fact, these Companies are specialized in the production of crop like Cymbidiums from Australia, New Zealand, Dendrobiums and Vandas/Mokaras, etc. from Singapore & Thailand, Phalaenopsis from Holland and Taiwan, so on. In other words, we are totally dependent on other countries for planting materials. Till the time we become self-reliant, India will have to depend upon advanced countries for quality planting stock and distribute to the growers or farmers for production of plants and flowers.

To achieve quality production, it is essential to identify the suitable agro climatic areas to establish **“Flori-tech village” clusters** in each State of the region (Hegde 1999) to adopt low cost green house and rain shelters for small farmers and climate controlled green houses for large export houses. In the Flori-tech Village Concept, cluster of villages will have a Cooperative with central model farm to cater to the needs of planting materials, impart training to the farmers, set up low cost small farm/poly houses and to organise marketing of the produces.

In an export oriented venture **where quality, quantity and regularity of production and supply are to be ensured**, green-house technology must be adopted. It requires investment and intensive management by trained managers devoted to the profession. Clockwise timely action right from planting, watering, fertilizing, controlling humidity, temperature, ventilation, light, pest & disease management, training of flower spikes, harvesting and post-harvest handling, transporting quickly & freshly up to the markets are of paramount importance for the success of Orchid Industry (Hegde 1999, 2001).

### **Medicinal & Aromatic Orchids**

About 55 species have been reported to be used in various systems of medicines in India for treating various disorders and diseases (Koushik 1983, Paul & Hegde 2001). Traditional practitioners mostly collect the plants in the wild and as a result, most of them have become rare & endangered. Hence, there is a need to develop a package & practice for their cultivation and propagation commercially to help the pharma industry with authentic, quality of planting materials with sufficient quantity and help conserve the natural population to survive & proliferate.

Role of governments, non - government organizations and individuals is very crucial in promoting the development of orchid industry in India. There is a need for a coordinated effort in focused R & D program in developing new hybrid strains suiting to various agro climatic conditions of our country involving various Institutions of excellence in developing climate specific strains of temperate Cymbidiums & Paphiopedilums, tropical Dendrobiums and Vandas and intermediate Cattleyas & Phalaenopsis, besides other ornamental native species for both cut flowers and pot plants along with their cultivation practices and packages.

## **PRESENT TREND IN EXPORT & IMPORT OF ORCHIDS**

To assess the trend in export & import of orchids in India, I undertook an analysis of import & export data from the important ports like Delhi, Mumbai, Kolkata, Chennai, and Bangalore for the years 2013, 2014, 2015 and 2016. I got the data with the help of my daughter Coerulea Hegde and sought the EXIM report month wise import and export data from M/S Seair Exim Solutions New Delhi and analyzed them for four years from 2013 to 2016. It is interesting to note that

- Most imported are the cut flowers (66%) of Dendrobium (85%) and Phalaenopsis (8%) from Thailand (90%).
- Most exported are the Tissue culture flaks/seedlings (97%) of Phalaenopsis (98%) to Netherlands(90% in 2015-16) & United States(98% in 2013-14).

### **Summary of the Import & Export can be given as follows:**

#### **1) Imports:**

- a. Species Most Imported
  - i. Dendrobium ~85%
  - ii. Phalaenopsis ~8%
- b. Type most imported: Cut Flowers ~ 66%
- c. Most Imported from: Thailand ~ 90%
- d. Import Port:
  - i. Largest Import is to Delhi at ~ 30% and its showing an increasing trend
  - ii. Bombay and Chennai are not far behind in imports
  - iii. In fact, all Metros a sizeable amount of imports

#### **2) Exports:**

- a. Species Most Exported: Phalaenopsis ~ 98%
- b. Type most Exported: Tissue Culture ~ 97%
- c. Country Most Exported to:
  - i. United States ~ 98% (2013/14)
  - ii. Netherlands ~ 90% (2015/16)
- d. Export Port: Almost all exports are from Bombay ~97%

## CONCLUSION

From the above analysis it is Interesting to note that from 2013 to 2016, there has been a decreasing trend in export of our Orchid products and increasing trend in import from 2013 to 2016. However, Positive trend is noticed in 2016 - 2017. Further, it is encouraging to notice export of Tissue cultured seedlings/flasks pointing towards sustainable development of native species. And, of course, it is a positive trend in the conservation of native orchids/germ-plasm. Since, large quantity of cut flowers & plants is imported from other countries, it is indicative that there exists domestic market with great demand for orchid cut flowers in our metros. Hence our focus should be to produce quality cut-flowers and pot plants in rural and urban areas to meet the domestic demand and target the export oriented farming on demand basis from abroad.

Besides, there a need to tap potentials of medicinally important orchids through R & D programs in boosting commercial production. A strong extension program of the technology & market driven approach to reach the stake holders, farmers & growers, in villages and Urban clusters involving the communities is required in promoting cultivation and production of the commercial orchids with a market driven approach for the development of a vibrant Orchid industry. Involvement of corporate sector would help in the production of quality planting materials in large quantities, distribution to the growers/farmers in village and urban clusters and marketing of their products for the benefit of the society and to boost Orchid industry in India.

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## **Extraordinary tales of love, lust and lunacy about orchids**

K S Shashidhar

What starts as a hobby for an orchid beginner will eventually gets him or her into 'addiction' and it is just a matter of time. Yes, the word addiction could be a strong one here, but that is how it is. Before you know what, you are doing, you will have collected hundreds of plants spending thousands of Rupees and the only restraint would be space and finances. When orchid growers meet, they only talk about orchids and trust me nothing else. Recently when three of us went on a photography tour for three days, we only talked and discussed about orchids. Slowly the beginner and amateur will turn into professional grower and will have lots of stories to tell about orchids. But what we hear from others or get to read about some of the most extraordinary tales about orchids starting from collection and maintaining the secrecy about it is really mindboggling. The hard-core grower may want to be the only one possessing a particular orchid and he definitely does not want to share with anyone. Here are some excerpts from the book *Orchid Fever* by Eric Hansen where some interesting tales are narrated and to what extent a collector can go to procure THAT ELUDING ORCHID.

### **Few interesting excerpts from the book *Orchid Fever* by Eric Hansen**

... ....The discussion shifted to a raunchy joke about *Cypripedium acaule* and the origin of the name *Cypripedium*. According to Joyce Stewart, in her book *The Orchid Paintings of Franz Bauer*, the word is derived from the Greek *Kypris Pedion*, which translates as "the genital region of Aphrodite". One look at the wrinkled, pink, pouting vertical lips of *Cypripedium acaule* explains it all. Then the orchid people discussed the merits of a product called Plant shine.

What is a plant shine? I asked

"Like the stuff they put on body builders and porn stars", said Joe, "It makes the leaves glisten"

"Oh", I mumbled

A third man seated at the table described a fellow grower in Santa Barbara who wore camouflaged army fatigues in the green house and carried an Uzi submachine gun while tending his plants. .... I knew it was time for be around normal human beings for a while.

Here is another interesting case showing orchid growers can go to any extent to pursue their hobby

**It is a letter written to the author (Eric Hansen) by an orchid grower from Norway.**

Dear Sir,

I am writing to you from the village of Nordkjosbotn, which is on the road between Narvik and Tromso. We are just above the arctic circle about 70 degrees North Latitude on the southern edge of the Barents Sea. A friend in the Norwegian Orchid Society told me that you are looking for people who grow tropical orchids in Unusual places.

I do not know if the climate is extreme enough for your purpose, I live with my family which includes 420 tropical orchids. I grow my orchids together with melons and tomatoes in a small green house from March to October and the rest of the time the orchids are put in the laundry room under lights where they stay warm for the winter months. My wife thinks that the orchids have taken over my life and she calls them my "green harlots".

Here is another interesting narration from the same book.

Dr. Guido Jozef Braem, is widely acknowledged world over as an authority on Paphiopedilums. The author met him and was discussing about orchid trade. While narrating Dr. Braem said that the custom officials in most of the cases cannot distinguish between various plants and not to talk about orchids. In 1986 when Dr. Braem was writing a book on Paphiopedilums, he wanted to have a look at the original plant *Cypripedium schmidtianum*, which was preserved in Denmark. Dr. Braem's colleague shipped the bottled specimen to Germany for Dr. Braem's perusal. As it was a dead flower preserved in a botanical institution, nobody thought of getting a CITES permit and that too it was sent on a loan. The customs officer charged Dr. Braem with CITES offence and also for smuggling a protected orchid into Germany. No amount of efforts to convince the Customs official that it is a dead orchid and CITES may not apply, did no good and in addition they charged him with tax evasion as there was no invoice. Eventually it was not released and Dr. Braem had to go all the way to Copenhagen to see the preserved specimen of *Cypripedium schmidtianum* and which turned out to be *Paphiopedilum callosum* which was a synonym.

**Reference:**

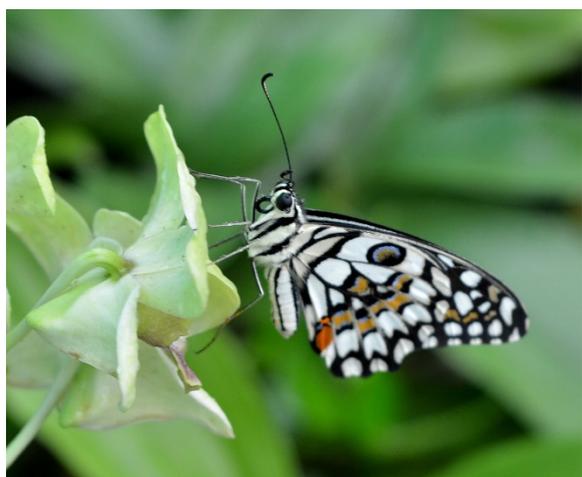
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## Interrelationship of Orchids and Pollinators

K S Shashidhar

Flowering plants tend to rely on other agents most of the times for pollination, so also the orchids. They lure the pollinators with some kind of rewards such as nectar, but whether they really get the reward or not is another question. But this delicate and sensitive mutual relationships in the ecosystem emphasizes the interdependence of various biota in the ecosystem. Orchids are known to have exclusive and specific relationships with pollinators which could be bees, wasps, flies, mosquitoes, butterflies, moths, fungus and gnats and in some cases birds. This is because orchids are known to prefer cross pollination. To enable this orchid are known to resort to complex and deceptive strategies. Orchid flowers lure the pollinators with deceptive signals or rewards of nectar, fragrance and in the process make the insect carry the pollen to another flower. Many times, the lure will end with the insect getting some nectar but more often it is nothing but deception. As Darwin observed that the complex structure of orchid flowers and their association with specific pollinators are devised to ensure cross pollination with pollen of the same species and to avoid self-pollination. Orchids are known to have specific pollinator association and the bizarre shapes, exotic colors and shapes are mainly to attract specific pollinators on one hand and dissuade other pollinators to reach the flowers.

Generally, the trend in orchids is to resort to cross pollination and discourage self-pollination. The pollinia are separated from the stigma by a part known as rostellum which also assists in transfer of pollinia from the pollinator to the stigmatic surface.



By observing the intricate mutual relationship between orchids and pollinators it appears that both of them have evolved together and develop strategies for its survival. Secreting nectars, putting out fragrance and other foul smells, flowers in all shape, size, color and mimicking is to attract the pollinators. Color of the orchids play an important role in attracting some of the pollinators like hummingbirds and butterflies which are active during day time have red, orange and pink flowers. Generally white and light green flowered orchids such as

Angraecoids are pollinated by moths and night flying insects. Another extreme case is that of *Bulbophyllum* which are known to display flowers with fleshy red and emit rotten meat odor. *Bulbophyllum phalaenopsis* has an inflorescence consisting of a cluster of about 15-20 meat colored flowers and the fleshy projections of papillae

resemble wriggling maggots and emit very bad odor. The focus is to entice the pollinator which is female carrion flies and engage it in a deception. So also, *Bulbophyllum beccarii*, if you are walking through and overwhelmed by the unmistakable stench of rotting Borneo Pygmy elephant then you have come across this plant.

The central American Bucket Orchid (*Coryanthes* spp) attracts euglossine bees. the lip of the flower forms a bucket shaped structure and is filled with a sweet-scented viscous liquid. The flower also has a pad with fragrant oil and the male bees gets attracted and scrapes off some of it and carry it on their back legs and the smell of these attract the female of the species. An interesting process of pollination is involved with *Coryanthes*, the surface of the flower is quite slippery and when the bee visits the flower often it may lose its footing and land up in the bucket filled with the viscous liquid. When they try to escape they have to come out through a narrow opening at the base of the lip. While doing so, they scrape against the column and the two pollinia gets deposited on its back. After drying off the bee visits another flower carrying these pollinia and deposit on the stigma of another flower enabling pollination.

*“Way back in 1862, few orchids were sent to Charles Darwin by a British Orchid grower from Madagascar. There was one orchid in particular a star shaped white one known as Angraecum sesquipedale with long nectary of almost 30 cm. Darwin observed that a moth with a tongue of length as long as the nectary only will enable the flower’s pollination and both will have evolved together. He then wrote to a friend at kew “I have just received such a box full from Mr. Bateman with astounding Angraecum sesquipedalian with a nectary a foot long. Good heaven what insect can suck it”, and later suggested that “in Madagascar there must be moths with proboscis capable of extension to a length of between ten and eleven inches “. This was one of the greatest observations and predictions of Darwin and became famous in the evolutionary field.*

Mimicking is another contrivance by which orchids resort to pollination and survival. Mimicking can be in the form of shape of the flower resembling the insects or by producing fragrance and attracting the opposite sex of the insects. This mechanism is so well designed in nature. *Ophrys* spp also known as the bee orchid, has lip resembling the body of a female wasp *Garptes mystaceus*. They put out a fragrance that simulates the pheromones produced by receptive females. This invites the male bee and it lands on the flower and grabs the lip and thinking that it is a female bee tries to copulate and in the process the flower deposits the pollinia on the

insect's head. The insect after the getting deceived, will move to the next flower unknowingly carrying on the process of pollination.

In the similar pattern European bee orchid *Ophrys apifera* adopts a unique mechanism of coinciding the opening of the flower with the emergence of the male bee and the tip of the flower resembling a female bee. The flower is designed in such a way that it not only looks like a female bee but also smells like one. Hence, it is the odor actually which attracts the males. Further, research has shown that the compound existing in the both the female wasp and the flower of *Chiloglottis trapeziformis* are identical, making it that orchids have evolved a mechanism and produce an identical compound used by the pollinators as a sex pheromone. Even some *Oncidium*s produce flowers resembling the males of few territorial bees or wasps and when the real bees see these flowers they see them as opponents and goes to attack them and in the process, pollination takes place.

*Scaphyglottis bidentata*, a south American orchid is pollinated by a humming bird. This flower is red in color and has no fragrance but attracts the pollinator (bird) with its nectar. Orchids are also known to regulate their bloom time in order to keep the chances of pollination higher and a successful one. Weather, pollinator activity, duration of opening of the flower are some of the features which play an important role in pollination.

Orchids definitely need their pollinators even though the pollinators not necessarily need them all the time. Thus, making it both orchids and the pollinators co-existence in the ecosystem an important feature. But with the degradation of habitat, fragmentation, both the orchids and its pollinators in many places are increasingly becoming rare and this is a warning for all of us that if orchids are to be conserved then it is 'package' where in insects or pollinators and the mycorrhiza and the tree that supports the mycorrhiza (for germination) all have to be conserved.

Nature has provided a unique association between orchids and their specific pollinators evolved over a long period. This phenomenon has to sustain in nature and the man's discretion plays an important role here. His interference in the natural process by indiscriminate use of chemicals and pesticides and coupled with degradation of habitat will spell disaster for orchids 'survival.

**References:**

1. Horak, David., 2004. Orchids and their Pollinators  
[www. bbg.org/gardening/article/orchids\\_and\\_their\\_pollinators.](http://www.bbg.org/gardening/article/orchids_and_their_pollinators)
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## Report on Bi Monthly Meeting of January 2018

Greetings and Good day. It turned out to be an action packed BMM yesterday with around 50 members attending this BMM. Summarizing the actions for those who missed and attended.

1. Society Plant sales was carried out by Suresh Kalyanpur assisted by Rajalaxmi (Raji)

2. A couple of new members joined the society. Details would be published in the minutes

3. 1 member had brought sick plants orchid clinic

plant were diagnosed with Fungal rot on Dendrobium caused due to over potting.

Encourage members to bring sick/ailing plants to diagnose and share knowledge on symptoms and treatment

4. There was a demonstration of basic potting for Dendrobium and Cattleya session focused for beginners

5. There was a good reception to Orchid display and competition

### Species Winners

- 1) *Rhynchostylis gigantea* (Nageshwar)
- 2) *Ionopsis utricularioides* (Anil kuber)
- 3) *Dendrobium heterocarpum* (Shashidar Sastry)

### Hybrid Winners

- 1) Paph NOID Complex hybrid (Lakshmi)
- 2) Oncidium Twinkle (Nageshwar)
- 3) Paphiopedilum Jollix Land X Yiyong Spring Mist (Nageshwar)
- 3) Blc Yellow Bird (Shakunthala Maney)

## Plant Display by Members

### Members Display (Species)



*Coelogyne breviscapa*  
Exhibitor: Dr. Parvathi



*Dendrobium anosmum*  
*var. superbum*  
Exhibitor Dr. Parvathi



*Dendrobium polyanthum*  
*var. cretaceum*  
Exhibitor Dr. Parvathi



*Dendrobium farmeri*  
Exhibitor Dr. Shashidhar



*Dendrobium tortile*  
Exhibitor Dr. Shashidhar



*Dendrobium secundum*  
Exhibitor Dr. Shashidhar



*Dendrobium barbatulum*  
Exhibitor Dr. Shashidhar



*Dendrobium senile*  
Exhibitor Nageshwar



*Vanda lamellata var. boxalii*  
Exhibitor Dr. Shashidhar



*Dendrobium cruentum*  
Exhibitor Sriram Kumar



*Dendrobium polyanthum var. cretaceum*  
Exhibitor Dr. Parvathi



*Dendrobium fimbriatum var. occulatum*  
Exhibitor Suresh Kalyanpur



*Paphiopedilum lunatum*  
Exhibitor Lakshmi



*Epidendrum stamfordanm f. alba*  
Exhibitor Sreenath Rao



*Paphiopedilum hirsutissimum*  
Exhibitor Lakshmi



*Paphiopedilum venustum*  
Exhibitor Lakshmi



*Paphiopedilum druryi*  
Exhibitor Nageshwar



*Paphiopedilum exul*  
Exhibitor Sabari



*Bulbophyllum grandiflorum*  
Exhibitor Lakshmi



*Paphiopedilum druryi*  
Exhibitor Nageshwar



*Maxillaria tenuifolia*  
Exhibitor Nageshwar



*paphiopedilum*  
*rothschildianum*  
Exhibitor Lakshmi



*Paphiopedilum sukhakulii*  
Exhibitor Lakshmi

### **Most Voted Species**

1. *Dendrobium anosmum* – Dr. Parvathi
2. *Paphiopedilum sukhakulii* - Lakshmi
3. *Dendrobium senile* - Nageshwar

**Members Display (Hybrid)**



*Cattleya* NOID  
Exhibitor Nageshwar



*Oncidium* NOID  
Exhibitor Nageshwar



*Lycaste* NOID  
Exhibitor Nageshwar



*Paph* NOID  
Exhibitor Nageshwar



*Oncidium* Gold Dust  
Exhibitor Nageshwar





*Cymbidium Chens Ruby*  
Exhibitor Sureshababu Donthi



*Dendrobium Helix*  
Exhibitor Shashidhar



*Dendrobium Red Emperor*  
Exhibitor Shashidhar



*Bl. Richard Mueller*  
Exhibitor Sreenath Rao



*Guaritonia Why Not*  
Exhibitor Sreenath Rao



*Cattleya NOID*  
Exhibitor Anil Kuber



*Oncidium Twinkle*  
Exhibitor Dr.Parvathi



*Cattleya Noir Leopard*  
Exhibitor Lakshmi



*Odontocidium Catatante*  
Exhibitor Lakshmi



*Phal NOID*  
Exhibitor Sabari



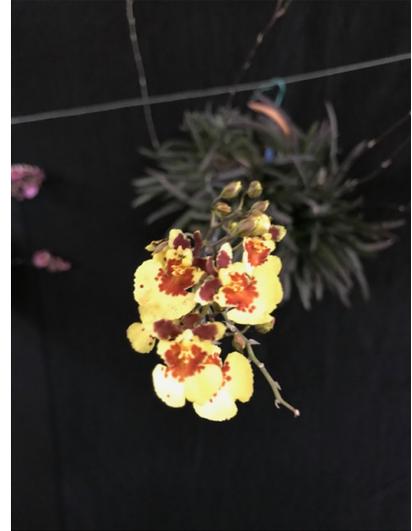
*Phal NOID*  
Exhibitor Sabari



*Cattleya NOID*  
Exhibitor Shakunthala Maney



*Cattleya* NOID  
Exhibitor Shakunthala Maney



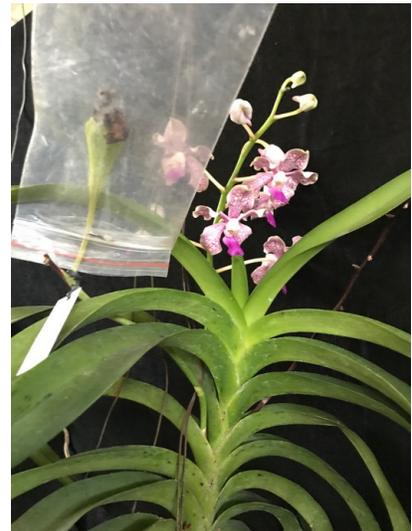
Tolumina  
Exhibitor Nageshwar



Tolumina  
Exhibitor Nageshwar



*Vanda* Bronze Butterfly  
Exhibitor Shashidhar



*Vanda brunnea* x *tessellata* x *luzonica*  
Exhibitor Shashidhar



*Vanda Somthawil*  
Exhibitor Shashidhar



*Dendrobium NOID*  
Exhibitor Sashidhar



*Dendrobium NOID*  
Exhibitor Shashidhar



*Epiarthorn Kevin Mark*  
Ragbir  
Exhibitor Sreenath Rao



*Vanda Jill Walker*  
Exhibitor Lakshmi



*Vanda Roberts Delight*  
Exhibitor Lakshmi

### **Most Voted Hybrid**

- 1) *Vanda Roberts Delight* - Lakshmi
- 2) *Guaritonia Why Not* - Sreenath Rao
- 3) *Paphiopedilum rothschildianum* hybrid - Lakshmi

## Overall Display



Overall display



Overall display

## PHOTO GALLERY - SPRING & SUMMER 2018



*Aerides emericii* Rchb.f.



*Chiloschista viridiflava* Seidenf.



*Vanda testacea* (Lindl.) Rchb.f.



*Dendrobium primulinum* Lindl.



*Dendrobium farmeri* Paxton



*Eria bractescens* Lindl.



*Dendrobium transparens* Wall. ex Lindl.



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