

Orchids of horticultural importance from Nagaland, India

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Abstract

The Nagaland state is home to large number of orchid species including species of horticultural importance. The orchid diversity of the state is about 396 orchid species under 92 genera. The present study was done with an aim to survey and identify the horticultural significant orchids of Nagaland and their commercial status. The orchid species were identified as floricultural importance by considering the keys like floral characters, spike length, attractiveness of flower and duration of bloom under natural condition. Accordingly, a total of 54 species has been identified as floriculturally significant with a potential to exploit commercially.

Key words: Horticultural important orchids, Nagaland.

INTRODUCTION

The orchids are a group of plants regarded as highly ornamentally important and valued taxa amongst the various plant groups. Orchids have their own unique characteristics and charms for their unique floral architecture. The beauty of orchid appreciation has a very long history in both western and eastern cultures. Much of this is attributed to the diverse form and structure they exhibit and the large number of species in the orchid family. Orchids are monocotyledonous plants belonging to the family Orchidaceae. Orchids exhibit diverse range of flowers and flowers are what clearly distinguish one orchid from another. The blooming duration varies from species to species from few days to more than a month. Orchids are not only a highly evolved group of plants but owing to curious shape, color and texture have attracted and mesmerize the people world over. Orchid cultivation has thus emerged as a highly rewarding enterprise. It is interesting to note that *Cymbidiums* of Eastern Himalayas which found entry to KEW botanical Garden more than a century ago is one of the main progenitors of large scale hybridization of orchids for commercial purpose. Moreover, the ease and its amenability to cross-pollinate across specific barrier make the orchid an ideal specimen among the plant breeders and floriculturist for developing new cultivar and hybrids.

Orchids are valued not only for their beautiful flowers but many of them have been used as a curative and for the therapeutic purpose since ancient times (Handa 1986; Kumar & Manilal 1994). In fact, orchid got its name from '*Orchis*' meaning testes describing the testicular shaped bulbs of the orchid which had been valued for their medicinal value in treating human virility.

Orchid cultivation which started as a hobby in the early part of 20th century transformed into a commercial enterprise in late sixties. They rank among the top ten sought after plant for cut-flower production (Vij 2002). The flowers of some modern hybrids have a shelf life of 8-12 weeks, surpassing all other flowers in this respect (Sinha 2000). The international trade in floriculture product is rapidly developing especially orchids which command a high price in world market. South East Asian countries are the major player in orchid trade. Thailand as the largest producer with an export destination to USA and Europe earning as high as 4 million US dollar by 1995 (Prasad & Prasad 1998). In several countries efforts are made to enhance the floricultural potential of orchids through desired mating, yet such activities are almost negligible in India along with North Eastern states including Nagaland despite its rich orchid genetic resources.

The state of Nagaland is an important reservoir of large number of orchids. The diversity of orchids was described by different groups (Changkija *et al* 1992; Deb *et al* 2003; Deb & Imchen

2008; Hynniewta *et al* 2000). According to Deb & Imchen (2008) Nagaland is a home to 396 species under 92 genera. The want of database on floriculturally important orchids comes in the way for policy makers and entrepreneur to asses the commercial exploitation in the state. Having felt need and to bridge this gap, the present study was initiated to survey and identify the horticultural important orchids of Nagaland and their commercial status.

METHODOLOGY

The survey and identification of floriculture viable orchids was carried out across the state. Study of habitat was conducted simultaneously during the field survey for the identified orchids. The assessment of its commercial potential was, thereafter done by surveying the local market centres of the state and the nature of demand. Certain parameters/characters of plant were adopted as keys for the convenience of study. These keys were used as a reference to identify the floriculturally significant orchid species. The keys like floral characters and duration of bloom under natural condition were taken into consideration for the present study. Following are the key characters adopted for the recognition of floricultural orchids.

1. Attractiveness of flower
2. Spike length and the numbers of flowers/spike
3. Blooming duration/Shelf life
 - a. Blooming duration up to two and half weeks
 - b. Blooming duration between three to five weeks
4. Scope of improvement through selective/desired breeding (for those species whose flower are attractive but has short blooming duration).

RESULTS AND DISCUSSION

In the present investigation, floriculturally significant orchid species were identified using the key floral characters mentioned in the study methodology. Through this intensive and extensive survey and study, a total of 54 species has been identified as floriculturally significant with potential to exploit commercially in due course of time if proper policy is framed and implemented by the concern department. The identified orchid species are given in the Table-I. Besides this, the identified species has the potential of improvement through desired mating to develop new hybrid and cultivar. This also, on the other hand, entails for judicious management and conservation of the species.

The identified orchids of different hue and colour with varied shelf life are from different genera available in the state of Nagaland, India. Despite the huge market potential of horticultural produce especially orchids; it is yet to be fully exploited in Nagaland. In the present investigation and assessment on the status and commercial prospect of the identified orchids, it has been found that market is highly unorganized. The wild orchids are found selling at a throw away prices in the local market by the village women who came from nearby and far flung areas of the market centre. The orchids are usually sold in bunches consisting of 8-10 stems/bunch. The orchids are, however, brought to market by the villager after collection from the wild habitat only during the flowering season. These bunches of orchids with flowers are found to cost variously from Rs. 20.00-40.00 only. These wild collected orchids were mainly purchase by hobbyist and flower enthusiast. This practice is however highly detrimental due to unorganized nature of market and put stress on the already siege biotic resources. While at the same it was found that there is great demand for orchid hybrids among the local populace. Most of these hybrids belong to the genera of *Cattleya*, *Cymbidiums* and *Dendrobiums* sold in the price range of ' 150 – 500 depending on the quality of hybrid. However, the market for the hybrid orchids is not organized unlike other states of India.

Table 1: List of orchids of Nagaland viable for horticultural practices

Name of the species	Flowering season	Habitat
<i>Aerides multiflora</i> Roxburgh*	June-August	Epiphyte
<i>Aerides odorata</i> Loureiro*	May-June	Epiphyte
<i>Arachnis labrosa</i> (Lindley ex Paxton) Reichenbach f**	August-September	Epiphyte
<i>Arundina graminifolia</i> (D. Don) Hochreutiner**	June-July	Terrestrial
<i>Ascocentrum ampullaceum</i> (Roxberg) Schlechter f**	April-May	Epiphytic
<i>Ascocentrum miniatum</i> Schlechter **	August-September	Epiphyte
<i>Bulbophyllum rothschildianum</i> (O' Brien) J. J. Smith*	September	Epiphyte
<i>Calanthe chloroleuca</i> Lindley**	April – May	Terrestrial
<i>Calanthe masuca</i> (D. Don) Lindley**	August– September	Terrestrial
<i>Calanthe plantaginea</i> Lindley**	March – April	Terrestrial
<i>Calanthe puberula</i> Lindley*	July-August	Terrestrial
<i>Coelogyne barbata</i> Griffith**	September-October	Epiphyte
<i>Coelogyne corymbosa</i> Lindley*	March – April	Epiphyte
<i>Coelogyne cristata</i> Lindley**	March –April	Epiphyte
<i>Coelogyne elata</i> Lindley**	May-July	Epiphyte
<i>Coelogyne flaccida</i> Lindley*	March –April	Epiphyte
<i>Coelogyne nitida</i> (Wallich ex D. Don) Lindley**	May – June	Epiphyte
<i>Cymbidium devonianum</i> Paxton**	May – June	Epiphyte, Lithophytes
<i>Cymbidium elegans</i> Lindley**	October-November	Epiphyte, Lithophytes
<i>Cymbidium iridioides</i> D. Don**	October-November	Epiphyte, Lithophytes
<i>Cymbidium lowianum</i> Reichenbach f**	April – May	Epiphyte, Lithophytes
<i>Dendrobium aphyllum</i> (Roxberg) Fischer*	April – May	Epiphyte
<i>Dendrobium chrysanthum</i> Wallich ex Lindley*	September-October	Epiphyte
<i>Dendrobium chrysotoxum</i> Lindley*	April – May	Epiphyte
<i>Dendrobium crepidatum</i> Lindley & Paxton*	March – May	Epiphyte
<i>Dendrobium densiflorum</i> (Lindley) Wallich*	April – May	Epiphyte
<i>Dendrobium falconeri</i> Hooker f*	April – May	Epiphyte
<i>Dendrobium fimbriatum</i> Hooker var. <i>oculatum</i> Hooker*	April – May	Epiphyte
<i>Dendrobium formosum</i> Roxburgh*	May – June	Epiphyte
<i>Dendrobium lituiflorum</i> Lindley*	April – May	Epiphyte
<i>Dendrobium moschatum</i> Swartz*	May-June	Epiphyte
<i>Dendrobium nobile</i> Lindley*	April – May	Epiphyte
<i>Dendrobium ochreatum</i> Wallich ex Lindley*	September-October	Epiphyte
<i>Dendrobium transparens</i> Wallich ex Lindley*	April-May	Epiphyte
<i>Dendrobium wardianum</i> Warner*	April-May	Epiphyte
<i>Dendrobium williamsonii</i> Day & Reichenbach f*	March – April	Epiphyte
<i>Esmeralda cathcartii</i> (Lindley) Reichenbach f **	March-April	Terrestrial, Lithophytes
<i>Gastrochilus calceolaris</i> (Buchanon-Hamilton ex Smith) D.Don**	March – April	Epiphyte
<i>Hygrochilus parishii</i> (Veitch & Reichenbach f) Pfitzer**	May – June	Epiphyte
<i>Paphiopedilum hirsutissimum</i> (Lindley) Stein**	April – May	Terrestrial
<i>Paphiopedilum insigne</i> (Wallich ex Lindley) Pfitzer**	May- June	Epiphyte

Name of the species	Flowering season	Habitat
<i>Phaius flavus</i> (Blume) Lindley**	March – April	Terrestrial
<i>Phaius tancervilliae</i> (Aiton) Blume**	April-June	Terrestrial
<i>Pleione hookeriana</i> (Lindley) Williams**	May – June	Epiphyte, Lithophytes
<i>Pleione maculata</i> (Lindley) Lindley**	September-October	Epiphyte
<i>Renanthera imschootiana</i> Rolfe.**	May – June	Epiphyte
<i>Rhynchostylis retusa</i> Blume**	April-June	Epiphyte
<i>Taenia latifolia</i> Bentham ex Hooker**	March-April	Terrestrial
<i>Thunia marshalliana</i> Reichenbach f**	June – Aug	Epiphyte, Terrestrial
<i>Vanda alpina</i> Lindley**	June-July	Epiphyte
<i>Vanda bicolor</i> Griffith**	February-March	Epiphyte
<i>Vanda coerulea</i> Griffith ex Lindley**	March –April	Epiphyte
<i>Vanda cristata</i> Wallich ex Lindley**	March-May	Epiphyte
<i>Vanda stangeana</i> Reichenbach f**	April – May	Epiphyte

*Bloom persists up to 15-20 days; ** Bloom persists over 30 days.

The orchid cultivation has come a long way over the years. It has evolved from a hobbyist market into a highly commercial market. The trade of orchid flowers is showing an upward trend in global market. Orchids such as *Cymbidiums*, *Dendrobiums*, *Phalaenopsis* and *Oncidiums* are marketed globally and the orchid industry has contributed substantially to the economy of many South East Asian countries (Hew 1994; Laws 1995). The market potential for both, orchid cut flowers and potted orchid is very favourable. So, large scale cultivation of orchid cut-flowers and potted orchids is now the trend. In the past, orchid growers and hobbyist relied solely on the collection of orchid species from the wild because the techniques of breeding and selection (either by conventional or genetic manipulation was not available). Moreover, obtaining planting material through conventional vegetative propagation method is slow and costly affair. Today, clonal planting material comes mainly from tissue culture. The availability of asymbiotic seed germination and tissue culture has made large scale orchid cultivation economically feasible and paved the way for intensive breeding and selection of new orchid hybrids.

Looking at the demand, suitability of climatic conditions and the rich germplasm resources of orchid in the state highly favors to venture into orchid commerce. It is however, essential to develop a high quality hybrid or produce an improved variety from the existing cultivar through conventional breeding or genetic engineering to carve a niche in the market. And to achieve this goal, a good understanding of orchid physiology is the key factor, supplemented by basic study on habitat ecology, cytogenetics, pollen biology, breeding behavior, nutrition, pest and disease with reference to the commercially significant species.

The economy for the state of Nagaland is basically agriculture based and mainly depends on forests and forest products for food fodder and medicine. Over 80% of the people of the state depend on indigenous system of medicine. The state is the home of a large number of orchids including many medicinal orchids (Deb *et al* 2009) which could be used by the ‘Local Healers’ in their practices. Beside this, Nagaland has the potentiality for the orchid based floricultural industry. Some of the key species which could be used for cut flower as well as for potential parents for viable hybrids are: *Aerides multiflora*, *Arundina graminifolia*, *Calanthe chloroleuca*, *Coelogyne corymbosa*, *Cymbidium devonianum* Paxton, *Cymbidium elegans* Lindley, *Cymbidium iridioides*, *Cymbidium iridioides*, *Cymbidium lowianum*, *Dendrobium chrysanthum*, *Dendrobium chrysotoxum*, *Dendrobium densiflorum*, *Dendrobium lituiflorum*, *Dendrobium nobile*, *Dendrobium transparens*, *Dendrobium williamsonii*, *Renanthera imschootiana*, *Rhynchostylis retusa*, *Taenia latifolia*, *Thunia marshalliana*, *Vanda alpina*, *Vanda bicolor*, *Vanda coerulea* and *Vanda stangeana*.

If these natural resources are used judiciously, it can generate employments for the unemployed educated/semi-educated youths which will, in turn, improve the economic condition of the state. Though these orchids play important role in different parts of our life, but their existence in their natural habitat is under threat. Therefore, it is need of the hour to work out the suitable conservation strategies and also to protect their natural habitats.

CONCLUSION

The present work brings about the rich orchid resources of Nagaland, India especially the floriculturally important orchids. However, the outcome of this investigation is just the beginning in realizing the orchid cultivation as a full-fledged enterprise in Nagaland.

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LITERATURE CITED

- Changkija, S.; Kumar, Y. & Gurung, P.B. 1992. *Orchids of Nagaland*. Forest Department, Nagaland, India.
- Deb, C.R.; Jamir, N.S. & Temjensangba 2003. Orchid diversity of Nagaland – A revised status. *J. Orchid Soc. India* 17: 5 – 15.
- Deb, C.R. & Imchen, T. 2008. *Orchid diversity of Nagaland*. SCICHEM Publishing House, Udaipur, Rajasthan, India.
- Deb, C.R.; Deb, M.S.; Jamir, N.S. & Imchen, T. 2009. Orchids in indigenous system of medicine in Nagaland, India. *Pleione* 3(2): 209 – 211.
- Handa, S.S. 1986. Orchids for drugs and chemicals. In: *Biology, conservation and culture of orchids* (ed. S.P. Vij). Pp. 89 – 100. Affiliated East-West Press, New Delhi, India.
- Hew, C.S. 1994. Orchid cut flower production in ASEAN countries. In: *Orchid Biology: Reviews and Perspectives*, Vol VI, (ed. J. Arditti). Pp. 365 – 401. John Wiley and Sons, New York.
- Hynniewta, T.M.; Kataki, S.K. & Wadhwa, B.M. 2000. *Orchids of Nagaland*. Botanical Survey of Nagaland, Calcutta, India.
- Kumar, S.C. & Manilal, K.S. 1994. *A catalogue of Indian orchids*. Bishen Singh Mahendra Pal Singh, New Delhi.
- Laws, N. 1995. Cut orchids in world market. *Floriculture International* 5(12): 12 – 15.
- Prasad, D. & Prasad, K.V. 1998. Orchids in world trade. In: *International festival of orchids* (ed. S. N. Hegde). Orchid Soc. Arunachal, Arunachal Pradesh, India.
- Sinha, S.K. 2000. Commercial cultivation of tropical orchids for income generation in Arunachal Pradesh. *Arunachal For. News* 18(1&2): 93 – 99.
- Vij, S.P. 2002. Orchids and tissue culture: Current Status. In: *Role of plant tissue culture in biodiversity conservation and economic development* (eds. S.K. Nandi, L.M.S. Palni & A. Kumar). Pp. 491 – 502. Gyanodaya Prakashan, Nainital, India.