

Orchids of floricultural importance from Arunachal Pradesh (India)

K. Chowlu and A. K. Das

Department of Botany, Rajiv Gandhi University,
Doimukh, Arunachal Pradesh – 791 111, India
chowlu_krishna@yahoo.co.in; arupbot@rediffmail.com

Abstract

Arunachal Pradesh is known for its rich biological diversity and the state is proud for this natural gift of almighty. The hilly regions are store houses of diverse flora which are useful in the economic development of floricultural plants. Orchids are a special plant of warm tropical moist area. This paper highlights few ornamental orchids like *Cymbidiums*, *Dendrobiums*, *Paphiopedilums* and *Vandas* which are commercially important as foreign exchange earning items of Arunachal Pradesh.

Keywords: Orchids, Arunachal Pradesh, India.

INTRODUCTION

India is known for its rich biodiversity, both plants and animals and therefore is considered to be one of the **Mega-biodiversity Centers** in the world comprising the “Biodiversity Hotspots”, the ‘Western Ghats & Sri Lanka’, ‘Himalaya’ and the ‘Indoburma’. About 15000 species of flowering plants grow in India and around 8500 species occur in the Indian Himalayan Region. Out of which about 8000 species are from NE Region alone (Hegde 2000). Arunachal Pradesh with an area 83,743 km² and 61.54% forest cover consists of tropical to alpine vegetation. A large number of orchids grow in this state. Among those, different species of *Cymbidium*, *Dendrobium*, *Paphiopedilum* and *Vanda* are commercially important as foreign exchange earners. In fact there are excellent opportunities for commercial floriculture both for domestic and foreign markets. The cultivation of orchids as non-traditional crops in the hill regions is now becoming popular.

Of all the wild ornamental plants, many species of orchids have established their potentials over the last one and a half century. Many species and cultivars of orchids are suitable for growing in agroclimatic conditions in N.E. Region (Hegde 2000). Sikkim (Gangtok), North Bengal (Darjeeling and Kalimpong) and Meghalaya (Shillong) are known for the trade in wild ornamentals. In Arunachal Pradesh also there is high potential for orchid development but due to transportation problem the industry is unable to develop up to the expected level. At present many of the species are becoming rare due to habitat destruction and over-exploitation. Hence, our wild species, which are progenitors of present day hybrids of commerce, must be protected and conserved. Again, trade of wild species is controlled by the Wildlife Protection Act and though there is ample opportunities to use these plants as the base materials for a much larger trade in flowers and flowering plants.

Distribution pattern of ornamental genera/ species of orchids in various phytoclimatic zones.

Table 1 presented the distribution of some orchid genera in Arunachal Pradesh growing under different phytoclimatic zones, starting from tropical and extending upto alpine zones. However, some of the larger genera like *Bulbophyllum*, *Cymbidium*, *Dendrobium* etc are distributed in much wider areas.

Table 1: Distribution of different orchid genera in Arunachal Pradesh under different phytoclimatic zones.

Phytoclimatic zones	Major orchid genera
I. Tropical zone	<i>Acampe</i> , <i>Aerides</i> , <i>Arundina</i> , <i>Bulbophyllum</i> , <i>Calanthe</i> , <i>Corymborchis</i> , <i>Cleisocentron</i> , <i>Dendrobium</i> , <i>Luisia</i> , <i>Gastrochilus</i> , <i>Goodyera</i> , <i>Malaxis</i> , <i>Eria</i> , <i>Oberonia</i> , <i>Papilionanthe</i> , <i>Phalaenopsis</i> , <i>Rhynchostylis</i> , <i>Spathoglottis</i> , <i>Tropidia</i> , <i>Tylostylis</i> , <i>Vanda</i> , <i>Zeuxine</i> .

- II. Sub-tropical zone *Acanthephippium, Apostasia, Bulbophyllum, Ceratoslylis, Eria, Chrysoglossum, Cymbidium, Cleisostoma, Coelogyne, Cryptochilus, Dendrobium, Epipogium, Galeola, Oberonia, Otochilus, Paphiopedilum, Phaius, Pleione, Vanda.*
- III. Temperate Zone *Bulbophyllum, Calanthe, Coelogyne, Cymbidium, Epigenium, Herminium, Paphiopedilum, Satyrium.*
- IV. Alpine Zone *Cephalanthera, Cypripedium, Habenaria, Herminium, Oreorchis.*

COMMERCIAL CULTIVATION

FLORICULTURE

Floricultural production activities are mostly confined to the plains and plateaus in the states of Andhra Pradesh, Haryana, Karnataka, Kerala, Maharashtra, Punjab, Tamil Nadu, Uttar Pradesh and West Bengal. Indian Himalayan Region including the North East having diverse agro-climatic conditions and with rich flora is particularly ideal in the development of floriculture industry. But at present, there is hardly any commercial floriculture development in NE region excepting Sikkim, Assam, Meghalaya and Arunachal Pradesh. Production of cut flowers and orchid plants has made good progress in Sikkim and Darjeeling. To some extent Arunachal Pradesh has also made some progress in cultivating orchids (Hegde, 1998), followed by Assam, Meghalaya, Mizoram and Nagaland. Though the situation in the state is ideal for orchid cultivation but the progress is not satisfactory and that is mainly due to lack of awareness among the local people.

Now-a-days ornamental floriculture in home gardens and public places is gradually gaining ground in NE. But it is yet to achieve in Arunachal Pradesh. No doubt few floriculture nurseries have come up in some towns like Gangtok in Sikkim, Darjeeling hills in West Bengal, Guwahati, Tezpur, North Lakhimpur, Dibrugarh and Jorhat in Assam and Shillong in Meghalaya catering to the needs of the urban folk. The Ministry of Agriculture through National Horticulture Board (NHB), Small Farmers Agri-business Consortium (SFAC) and Agricultural Processed Food Products Export Development Authority (APEDA) has initiated several promotional schemes for the development of floriculture. ICAR has also been providing R & D support. However, a serious attempt and efforts are needed for augmenting development of this sector in Arunachal Pradesh by involving the local entrepreneurs, farmers and by mobilizing the governments, financial institutions and private investments to harness this potential.

The diverse climatic conditions with varying elevations of the hills of Arunachal Pradesh is suitable for growing varieties of orchids for cut-flowers, pot and foliage plants round the year. Some of the commercially important orchids as cut flowers of the state are different species or cultivars of *Aranda*, *Cymbidium*, *Dendrobium*, *Oncidium*, *Paphiopedilum* and *Vanda*.

Cultivation of selected orchids: Government of India has recognized orchids as the prime plant group for promoting export oriented activity in NE region. This region specially enjoys tropical and temperate climatic conditions, which is congenial for the growth of orchid cut-flower industry. However, concerted effort in developing the indigenous hybrids matching the market through breeding and plant improvements adopting the modern biotechnological means is the need of the hour. In this regard, development of hybrids like *Renades* “**Arunodaya**”, *Ascocenda* “**Tipi Blue boy**”, *Arachnocentron* “**Tipi Jubilee Star**”, *Aranda* “**Millennium Dawn**” and *Cymbidium* “**Sessa Green Beauty**”, involving the genera/species of *Aerides*, *Esmeralda*, *Renanthera*, *Cymbidium*, *Paphiopedilum*, *Vanda* etc. are significant in Arunachal Pradesh (Hegde 1998, 2001). Further, mass-production of selected superior hybrid planting material through tissue culture is an important area requiring attention in commercial floriculture (Hegde 1991, 1995, 1999).

Cultivation/Farming

In Arunachal Pradesh cultivation of floriculture has got some field in public places and some home gardens. Hence, cultivation of orchid industry in the state has got some places. Modern floriculture is an integrated technology based on biological sciences making use of hardware engineering mechanisms. Understanding of

genetics and physiological requirements of plants (Orchids) is needed to meet the stringent requirements in the quality of cut-flowers to match the market demands. Hence, right from seed germination, protocorm production, *in vitro* propagation, production of hybrids and induction of polyploidy, differentiation of seedlings into plantlets, hardening, transplanting to farm houses, growing them to flower as per the requirement, harvesting and upto transportation to the market, everything at every stage biological principles are employed in achieving perfection. Strong straight spike Flowers fully open, free from blemish, clear color, broad strong petals each flower facing the same side no sign of insect damage is given preference.

Technology of Green house is the recent 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 crops in the hill regions depending upon the crop (Singh & Dadlani, 2000). In order to achieve the same, it is essential to identify the suitable agroclimatic areas to establish "Flori-tech village" clusters in each state of the region (Hegde 1999) to adopt low cost green house and rain shelters (Dutta 1997) 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 and to organise marketing of the produces.

In the temperate region, hybrid clones of *Cymbidium* are recommended for its growth which should be procured from reliable sources and grown. Also some hybrids of were recommended.

Cymbidium : **Golden Fleece, Mieke, No-Do, Noderhorst, Molly cascade, Perfection, Sungreen, Pink lady, Benjamin**, etc.

Paphiopedilum Hybrids.

Similarly in tropical conditions following genera are recommended.

Dendrobium : **B.B. White, Watter, Sonia-16, 17, 28, Lady Laura, Karen No-4, Nantavaran, Joan Kushima, Pampadour**, etc.

Other genera are *Mokara, Aranda, Phalaenopsis, Vanda*, etc.

In an export oriented venture where **quality, quantity and regularity** of production and supply are to be ensured, **green-house technology** has to be adopted as has been done by M/s. India Carbon Ltd. Guwahati, M/s. Nanakoo Orchids, Hapoli (Ziro) M/s. Natural Synergies, Chennai, M/s. Indo American Hybrid Seeds, Bangalore and M/S. A.V. Thomas & Co. Cochin. It requires investment and intensive management by trained managers devoted to the profession. Clockwise timely action right from planting, manuring, 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 the floriculture business (Hegde 1999, 2001).

Constraints and suggestions:

In fact, floriculture industry is highly competitive and sophisticated. There are ever changing taste and trend in the market with respect to colour of flowers, shape, size, etc. Floriculture products are highly perishable excepting dry flowers and therefore efficient handling and quick transport system are of paramount importance. Similarly, there is always a demand for newer planting materials. Hence, one of the important aspects is backing of research and development to this industry. Following are the main advantages and constraints in the development of floriculture in the state.

Advantages of floriculture development in the state are:

- Ideal agroclimate
- Varying elevations and climatic conditions
- Rich germ-plasm/genetic resources

Main constraints are:

- Difficult terrain
- Poor communication system
- Lack of infrastructure
- Inadequate R&D support
- Lack of intensive breeding and plant improvement programs
- Lack of data base
- Non-availability of quality planting materials
- Lack of Mass propagation protocols on agrotechnique
- Lack of post-harvest technology
- Lack of market information, linkage and marketing centres in the region
- Inadequate institutional and financial support
- Jhum agricultural practice and lack of alternatives to the same
- Lack of land holding system in NE Hill states
- Lack latest technology, trained man-power and extension programs.

Once these constraints are addressed by creating awareness, floriculture can become a boom to Arunachal Pradesh.

CONCLUSION

No doubt, floriculture industries have immense potential in Arunachal Pradesh but concerted efforts and support is needed by various agencies like administration, financial Institutions, Non-government organizations, Universities and Institutes and individuals, to usher into the era of floriculture and economic development of the region. Awareness programs are also needed to attend the attraction of the public in general and entrepreneurs in particular to reap the benefit of mean production and trade on ornamental orchids.

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