

## ORCHIDS FROM PENINSULAR INDIA AND THEIR ECONOMIC ASPECTS

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## INTRODUCTION

Orchids, forming the largest family of flowering plants (7% of the total Angiosperms) exhibit an incredible diversity in size, shape and colour of flowers. They are valued for their longer lasting bewitchingly beautiful flowers.

Majority of the orchids known to cultivation occur in humid tropical forests, of countries in south and central America, in India Ceylon, Burma, South China, Thailand, Malaysia, the Phillipines, New Guinea, Australia etc. Brazilian *Cattleyas*, Mexican *Laeleyas* and Indian *Dendrobiums*, *Cymbidiums* and *Paphiopedilums* have played a major and important role in the development of a large number of modern day hybrids (Northen, 1962).

A rough estimate of the number of orchid species is around 30,000 species belonging to 700-800 genera (Hawkes, 1965). In addition, there are more than 35,000 registered hybrids (Marden, 1972) with an increase of 1000-1500 per annum. Orchids, although cosmopolitan in distribution are not at all densely populated and are limited in number even in the most congenial environment. Any disturbance or removal of plants will badly upset their ecology. This is one of the reasons for the gradual extinction of different orchid species from their natural habitat.

Out of the total of about 2000 orchid species found in India, more than 250 species are found in Peninsular India, especially in the

Western Ghats in areas like Idukki District in Southern Western Ghats, Kundah forest region in the south western part of Nilgiris and Agasthyamalai hills in the southern part of Western Ghats. Some of the Eastern Ghat regions like Ganjam Hills, Koraput Hills, Rampa, Gudem, Vishakhapatnam and Shevaroy are also rich in orchid flora and have more than 75 highly exquisite species. Fischer in Gamble's *Flora of the Presidency of Madras* has reported more than 197 species of orchids from these areas.

## SOME IMPORTANT ORCHID SPECIES OF PENINSULAR INDIA

Some selected orchids of Peninsular India of potential commercial value and worth cultivating on a large scale for earning foreign exchange are described below.

1. *Aerides crispum* Lindl.

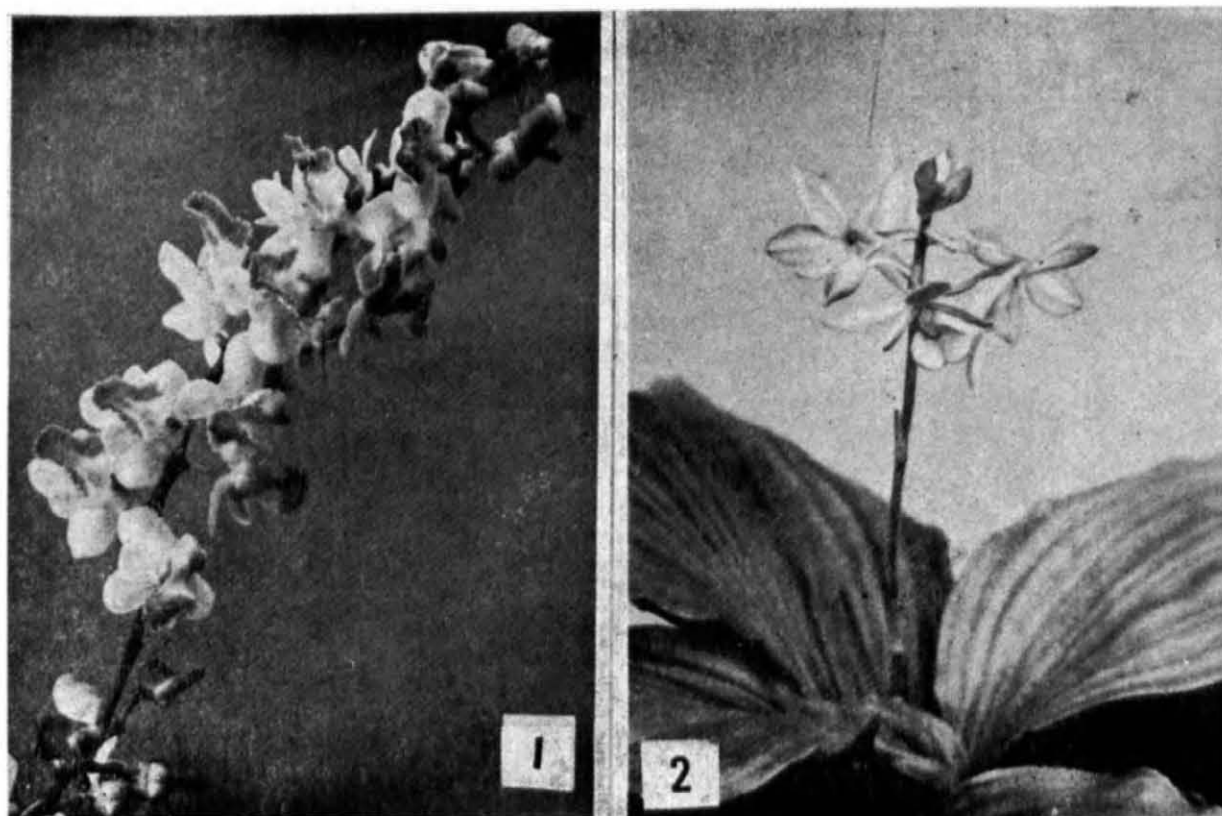
The drooping racemes of fragrant wax like flowers are elegant (Fig. 1). Stem usually dull violet purple. Leaves spreading, bilobed at apex. Flowers 4-5 cm across, among the largest in the genus, with a pineapple fragrance. Sepal and petal white, lightly tinted with rose purple. Lip three-lobed, middle broadly ovate, saddle-like, serrate margined, rich amethyst purple. Spur small, horn like. Column white. Anther yellow. Flowering in May and June, long-lasting. Two varieties, var. "*lindleyanum*" and var. "*warmeri*" have been reported. (Veitch, 1887).

## 2. *A. cylindricum* Lindl.

A very distinct species from the Western Ghats, often confused with *A. vandarum* of North East India. The stem is pencil thick. Leaves 9-13 cm, terete. Flowers on short stout peduncles, 2-4 cm across lightly scented, white flushed with pink. Sepals obtuse. Petals broader and shorter. Lip white, the side lobes violet streak, front lobe, fleshy, covered with three broad blunt yellow keels. Spur recurved. Flowering : April-May.

## 3. *Bulbophyllum neilgherrense* Wight

A pseudobulbous epiphytic plant with creeping rhizome and bearing solitary or sometimes paired persistent leathery leaves. Inflorescence up to 12 cm, lax, arising from the base of the pseudobulb. Flower is remarkable for its hinged, mobile lip. Petals pale yellow, gland dotted. Pollinia 4, attached in pairs, waxy, yellow. Flowering in December. The species is being used as mother plant for many new intergeneric hybrids in foreign countries.



Figs 1-2 1 *Acridos crispum* Lindl. A Flowering branch. 2. *Calanthe masuca* (D. Don) Lindl. A plant with leaves & flowers.

## 4. *Calanthe masuca* (D. Don) Lindl.

One of the most beautiful terrestrial orchids. Leaves oblong, lanceolate, green (Fig. 2). Flower spike longer than the leaves, many-flowered. Flowers crowded at top of

spike purplish mauve, 4-6 cm across, with a curved violet spur. Lip deeper in colour than other segments, three lobed. Column very short. Rostellum consisting of two projecting plates. Capsule elliptic. Flowering : October-November,

### 5. *Cymbidium aloifolium* (L.) Sw.

A robust epiphyte with thick matting roots. Pseudobulbs ovoid, sheathed by leaf bases. Inflorescence 20-30 cm long, pendulous racemes sheathed at the base. Flowers bracteate pedicellate, yellowish with a purple median band. Throat of lip with two yellow calli. Column brown except at top. Capsule ovoid, elliptic, green, grooved. Flowering : May-June.

Sap of the leaves is styptic, this leading to its removal in the forests and gradual disappearance in some areas.

### 6. *Dendrobium aqueum* Lindl.

The specific epithet *aqueum* refers to the pale watery green flowers. Pseudulous, epiphytes. Pseudobulbs thin at the base. Leaves alternate, falling off immediately after flowering. Inflorescence of fascicles of 2-3 flowers from the upper portion of each node. Flowers white, tinged with green. Lip 3-lobed, whitish green. Column stout, green; foot with a nectary at the base. Capsule pyriform. Leaves : June to October. Flowering : September-October.

### 7. *D. barbatulum* Lindl.

One of the very beautiful species of the *Dendrobium* group, restricted to Peninsular India, the species is found all long the forest areas skirting the coast. Slender branches of the species covered with large number of white flowers give a feeling of purity, grace and charm (Fig. 3). Stem 15-35 cm long, tapering at apex. Inflorescence in lateral racemes, 5-25-flowered. Flowers 2.3-4.5 cm, white with lilac tinge. Petals lanceolate, tapering. Lip with 2 small lateral lobes. Pollinia 2 pairs, waxy.

The species can be cultivated easily in the glass-house. (Singh, 1975) and can be used in the breeding of different *Dendrobium*

groups. A natural hybrid between *D. barbatulum* × *D. chlorops*, called *D. barbatulochlorops* has been reported by Rolfe in 1893 (Santapau & Kapadia, 1966).

### 8. *D. lawianum* Lindl.

Pseudulous epiphytes, leafless at the time of flowering. Pseudobulbs tapering at both ends, greenish white. Leaves sessile, sheathing at the base. Flowers subregular, from the nodes, in pairs. Sepals and petals waxy, white flushed with rose purple. Lip broadly ovate, slightly clawed at base. Column with a white-pink projections at base. Capsule ovoid, pale green. Leaves : June-October. Flowering : March-April.

### 9. *D. ovatum* (Willd.) Kranz.

Pseudobulbs leafless at the time of flowering. Internodes many. Leaves caducous, alternate, sheathing. Inflorescence in racemes from the apical part of the pseudobulb, in groups of 6-9, coming into flowering at intervals. Racemes about 15 cm long, sub-pseudulous. Flowers cream yellow, with pale green centres. Lip slightly clawed at the base, 3-lobed. Column with a broad foot. Capsule oblong purple, ribbed. Leaves : July-October. Flowering : October-February.

### 10. *Eria dalzellii* (Dalz.) Lindl.

Epiphytes. Pseudobulbs discoid. Leaves 3-5, sessile, sheathing at the base. Raceme 6-10 cm, tall, erect. Flowers faintly perfumed, stalked. Petals creamy yellow, entire, curved at apex. Mentum present. Lip minutely papillate. Column short, foot at right angles to column. Anther yellow. Capsule ellipsoid. Flowering : July-August.

### 11. *Eulophia ochreatea* Lindl.

Pseudobulbs ovoid with irregular longitudinal markings. Leaves 2-5, arising from the

base of the pseudobulbs. Flowers in dense racemes, clustered at the top of the scape. Sepals and petals yellowish green with purple spots on the inner surface. Lip 3-lobed, pale cream purplish at the base. Column with a small 2 mm long foot. Capsule broadly ovoid, ridged. Flowering : June-July.

#### 12. *Paphiopedilum druryi* (Bedd.) Pfitz.

The species was discovered in 1865 on the Travancore hills by Colonel Drury after whom it is named and is the only species of *Paphiopedilum* in Peninsular India and is unfortunately almost at the verge of extinction (Katak, 1976). This badly needs protection and conservation.

It is a dwarf plant, with creeping rhizome. Leaves 10-17 cm long. Scape single flowered. Flowers about 7-9 cm across. Dorsal sepal broad, marked in the midrib with a brown-black band. Petals broad, curved downwards, yellowish with a similar black band. Lip helmet shaped, bright yellow, spotted with red purple on the inside (Fig. 4). Flowering : February.

#### 13. *Pholidota imbricata* Lindl.

Commonly called "Rattle Snake Orchid" Pseudobulbs ovoid conical, dull-grey. Leaf solitary, from the top of the pseudobulb; rachis from the top of the pseudobulb. Raceme 40-50 cm long, pendulous. Flowers dirty pink, closely distichous. Lip pale pink. Column winged; margin serrulate. Capsule pale brown, shiny (Fig. 5).

The species is genetically compatible with some species of *Coelogyne* (Veitch, 1963) and a large number of attractive multi-generic crosses seem quite possible.

#### 14. *Rhynchostylis retusa* (L.) Bl.

Commonly called "Fox Tail Orchid", this

has high ornamental value both for exhibition and for decoration (Fig. 6). Epiphytes. Stem sheathed. Leaves coriaceous, channelled, with pointed apex. Racemes up to 30 cm dense, cylindric, drooping. Flowers pale pink with deep coloured spots, 1.5-2.0 cm in diameter. Spur compressed, as long as the lip. Lip purple. Column beaked. Anther small, pink. Capsule obovoid.

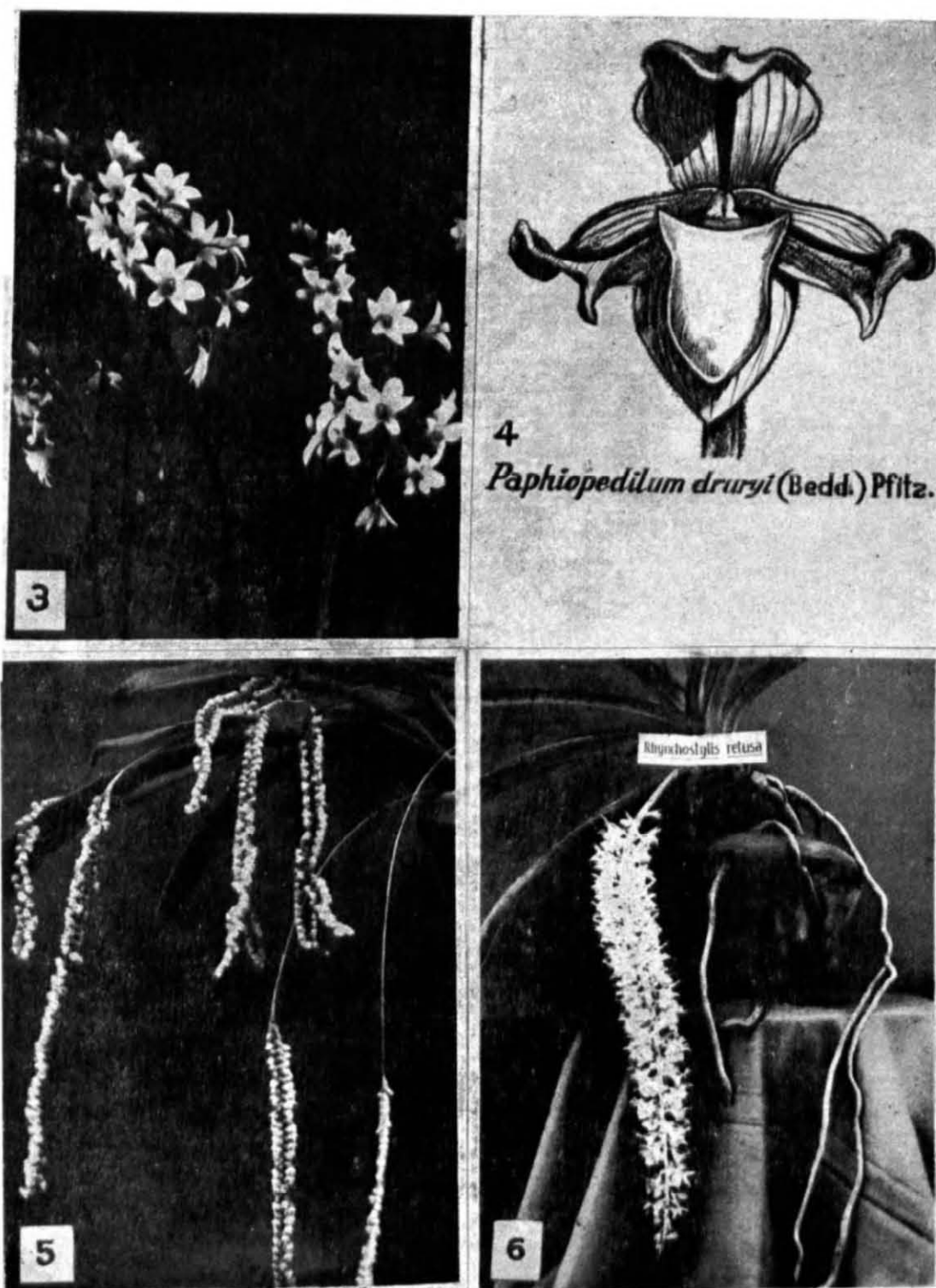
There is considerable natural variation in the density of spotting of floral parts.

#### 15. *Vanda teres* Lindl.

One of the most beautiful orchids used as cut flowers, locally called "Pencil Orchid" or "Parrot Flower Orchid" The stem is terete, noded. Leaves also terete, up to 10-15 cm long with an obtuse apex. Inflorescence lateral, long or equal to leaves. Flowers large and showy, 6-8 cm long, lax. Sepals broadly oblong, the dorsal sepal up to 2.5 cm long, the lateral sepals broader than the dorsal, pink with pale apex. Lip 3-lobed; side-lobe roundish, convolute, tawny yellow with red spots on the inner side; front-lobe with broad claw. Spur funnel shaped, compressed laterally. Column white. Anther beaked. Flowering : April-May.

#### ECONOMIC ASPECT AND COMMERCIAL CULTIVATION

Growing orchids and selling has become a profitable business. Small countries like Thailand and Singapore are doing very well in orchid trade and their export value of vandeaceous and other tropical orchids is approximately seven million dollars per year (Bose and Bhattacharjee, 1972). In Sri Lanka (Ceylon) the commercial cultivation of orchids is managed by a cooperative society which collects the flowers from different growers and export them after proper sorting and packing. This has made orchid cultivation a small scale industry,



Figs. 3-6 3 *Denarobium barbatulum* Landl. The orchid in flowers. 4 *Paphiopedilum druryi* (Bedd.) Pfitz. A Flower. 5 *Pholidota imbricata* Lindl. A plant with drooping flowers. 6, *Rhynchosstylis retusa* (L.) Bl. The plant with drooping flowers.

In India, however, there is no organized orchid industry. A few nurserymen from Kalimpong and adjoining areas are exporting the Indian species without any consideration to their large scale propagation. It may not be out of the way to mention here that some of the famous North-east Indian species which used to be found in abundance like *Coelogyne cristata*, *Cymbidium elegans*, *Dendrobium densiflorum*, *D. formosum*, *Thunia alba*, *Vanda caerulea* etc., are all scarce in the forest, almost at the verge of extinction.

Peninsular India, with its rich orchid flora and differences of physiography into plains and mountains can be exploited in having different centres for the commercial cultivation of ornamental orchid species both for the sale of planting materials and cut flowers. Some of the species like, *Dendrobium barbatulum*, *Calanthe masuca*, *Cymbidium aloifolium*, *Paphiopedilum druryi* and *Rhynchostylis retusa* have promising international market. We have also a large number of "Botanical species" like *Oberonias*, *Bulbophyllums*, *Coelogyne*s, *Erias*, *Geodorum*, *Porpax* etc., which have their own place in the breeding of orchids. Biosphere reserve for different species should be maintained in different regions to conserve the species in their natural habitat.

There can be three broad categories for the development of orchid industry in Peninsular India.

1. *Sale of plant material* : Novelty, uniqueness and rarity are the chief requisites for the sale of different species.

All available species found in our forests should be collected, properly identified, cultivated in green houses with less scorching sun and high humidity and then sold in international market. Several of the Indian species, due to their endemism, uniqueness and rarity are assured of a market abroad.

2. *Export of cut flowers* : Some of the native orchids like species of *Cymbidium*, *Paphiopedilum*, *Vanda*, *Rhynchostylis* and *Dendrobium* can be grown on large scale for cut flower production for the foreign market.

It is also recommended that a large number of hybrid seedlings of outstanding parents may be imported in order to provide diversity in genetic types and grown in several orchid breeding centers.

3. *Propagation of orchids through seed/meristem culture* :

In India, however, such techniques have not been used commercially so far due to lack of initiative and necessary facilities required for growing orchid plants from seeds. The meristem culture which enables the production of much higher number of plantlets (genotypically similar) in a short time as compared to earlier methods of vegetative propagation has not been tried yet by any commercial grower in Peninsular India.

We have two very well established laboratories, National Botanic Research Institute at Lucknow and Indian Institute of Horticultural Research, Bangalore, where work on the propagation of orchids through seed/meristem culture is being carried on. Some of the progressive growers can be trained in these laboratories for the flasking of seeds which has become highly simplified due to modern technology. Fresh seeds can be grown into 4-6 leaf stage within a span of 2-4 months (see Fig. 4).

A single orchid capsule contains 3-4 millions of tiny seeds and under controlled conditions, a grower can have any number of seed flasks for sale from a single capsule. An instant new medium has been recommended by the orchid laboratory of Indian Institute of Horticultural Research and any orchid grower can grow his selfed or hybrid seedlings by using this medium and following simple instructions.

There is a very bright future for Indian orchid industry in Peninsular India on scientific basis by employing the standard methods like collection, evaluation, breeding and propagation by seed culture and meristem culture techniques.

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