



The Orchids of India: Preserving Natural Heritage

J. Ramudu

Lecturer in Botany, Dr Laki Reddy Hanimi Reddy Government Degree College, Mylavaram, NTR
District, A.p-521230

Abstract:

In India, orchids are distributed in North Western Himalayas, Western Ghats, Eastern Ghats. North Western Himalayas comprises the states of Jammu and Kashmir, Himachal Pradesh and Uttarakhand. The topography of North Western Himalayas region is regular and intercepted by valleys and plateaus of various extent and as such the stratification is not clear. Western Ghats includes the states of Gujarat, Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu. This region also consists of valleys and plateaus. Eastern ghats States or Odisha Andhra Pradesh Telangana Karnataka, Tamil Nadu consists of valleys and plateaus. In these regions there is a great diversity in the floristic pattern due to great altitudinal variation. The orchidaceae family exhibits enormous diversity. In this paper different regions in India, richness of the orchid diversity and their conservation strategies are suggested.

Keywords: Orchidaceae, Eastern Himalayas, Western Ghats, Eastern Ghats, species richness, conservation strategies.

Introduction

The Orchidaceae is one of the largest families of flowering plants. Because of their magnificent flowers the members of the family Orchidaceae are highly developed group of plants and have fascinated many a people. An enormous diversity has been exhibited in this family. Based on botanical survey of India and herbarium records about 1331 species in 180 genera of orchids are known from India (Misra, 2007), out of which 39 species belong to 72 genera are known from north west Himalaya (Deva and Naithani, 1986). Because of the existence of lip of labellum which is the modification of one of the perianth of the inner whorl a column in the centre formed by the union of stamen and style they are pollen grains from pollinia and have minute seeds without endosperm can be easily identified. The orchid-rich regions in India are the North-Eastern region, particularly the Eastern Himalaya, Meghalaya, Mizo or Lushai Hills and the Naga Hills; Sikkim in particular, rich with orchids; North-Western Himalayan region and also Western Ghats, the detached Pulney, Nilgiri and

Biligirirangan Hills (Rao, 1979). The Himalayan kingdom's such as Nepal and Bhutan also have rich orchid diversity. Orchids occur in other parts of the country, but they are few and scattered. They are found in different altitudes, from 150 m. to 2500 m. Mostly they thrive in warm humid weather, occurring in dense tropical rain forests, as well as in temperate cloud forests. Generally maximum orchid diversity is found in tropics.

Distribution of Orchids in Westren Ghats

The vegetation in Western Ghats is tropical rain forests. In Western Coastal plains, up to 300 m altitude, high amount of moisture, heavy rainfall and high temperature is recorded; some epiphytes such as *Acampae praemorsa*, *Bulbophyllum acutiflorum*, *B. aureum*, *B. elegantulum*, *B. fimbriatum*, *B. fuscopurpureum*, *B. neilgherense*, *B. keralense*, *B. mysorensense*, *B. nodosum*, *B. orezii*, *B. proudlockii*, *B. rheedei*, *B. rosemarianum*, *B. silentvalliensis*, *B. tremulum*, *Cymbidium aloifolium*, *Dendrobium macrostachyum*, *Luisia zeylanica*, *Pholidota pallida* and terrestrial orchid, *Eulophia epidendreae* were recorded (Abraham & Vatsala, 1981). As we get nearer to the mountain ranges there is an increase in density of orchid population. As we go up to 300-600 m, the vegetation increased its density; some species viz., *Aerides ringens*, *Dendrobium ovatum*, *Oberonia brunoniana* and *Polystachya flavescens* appeared.

About 267 orchid species were reported from Western Ghats of India (Kumar, 1991). Totally 125 endemic orchids from this region, of which 98 species were endemic to Western Ghats and 27 had their distribution extending to Eastern Ghats (CAMP Report, 2001).

Typical rain forests was found at an elevation of 600-1300 m with dense canopy and very little light penetration. Epiphytes were rare in this zone due to poor light penetration. The terrestrial orchids such as *Acanthephippium bicolor*, *Calanthe masuca* and *Eulophia macrostachya* were recorded from this zone.

At an elevation of 1700-2300 m., it is too cold and dry for epiphytic orchids. *Habenaria* spp. and its allies continue to occupy the meadows through at a diminished frequency. Above 2300 m altitude orchids disappeared gradually (Abraham & Vatsala, 1981).

Distribution of Orchids in The North Eastern Region in India

The north-eastern region of India is bordered by China in the north, Bhutan and Nepal in the West, Bangladesh in south and Myanmar in the east. Tropical orchids enjoy humid and warm environment and grow luxuriantly during rainy season.

Eastern Himalaya comprising an area of 83,578 km., has a massive forest cover with the altitudinal variation from 170-5,000 m. It receives an annual rainfall ranging from 700 to 6,500 mm resulting in big and small rivers and rivulets and therefore a humid climate prevails through out the year; this favour orchids to flourish in all vegetational types. Depending on their habitat, broadly four orchid-rich zones are recognized in Eastern Himalaya, especially in Arunachal Pradesh (Hegde, 1984).

1. Tropical Evergreen rain-forest zone: altitude from 170 to 900 m.
2. Sub-tropical Forest zone: from 900-1800 m.
 - (a) Mixed wet forest belt
 - (b) Mixed or Pine (partially dry) forest belt.
3. Temperate forest zone: from 1800 to 3,500 m.
4. Alpine forest zone: 3,500-5,000 m.

Tropical evergreen rain-forest zone is characterized by broad leaved evergreen vegetation with high rainfall, warm temperature and humidity (90-100%). Both epiphytic and terrestrial orchids are equally distributed in this zone. The genera like *Bulbophyllum*, *Dendrobium*, *Coelogyne* and *Eria* are very common in this zone. Some of the bulbophyllums that are present in this zone are: *B. capillipes*, *B. clarkeanum*, *B. delitescens*, *B. hirtum*, *B. reptans*, *B. sikkimense*; and dendrobiums are *D. acinaciforme*, *D. aduncum*, *D. anceps*, *D. aphyllum*, *D. cathcartii*, *D. cumulatum*, *D. lituiflorum*, *D. moschatum*, *D. nobile* etc. Subtropical forest zone receives comparatively lesser rainfall; however, cooler and humid conditions are prevailed in this zone. Both epiphytes and terrestrials are present in this zone. Some of the saprophytic species such as, *Cymbidium eburneum* and *Eulophia zollingeri* are present in mixed wet forest belt of this zone. The spectacular orchid *Paphiopedilum fairieanum* known as 'Lost Lady Slipper Orchid' is found in isolated patches in West Kameng district of mixed forest belt (Hegde, 1984). Some epiphytic species of *Bulbophyllum*, *Coelogyne*, *Cymbidium*

and *Dendrobium* are invariably found in subtropical forest zone. Some of dendrobiums present in this zone are *D. chrysanthum*, *D. falconeri*, *D. wardianum* etc., and bulbophyllums are *B. acutifolium*, *B. affine*, *B. cauliflorum*, *B. leopardianum* etc. Temperate forest zone is characterized by moderate rain-fall, frost in the form of heavy fog and short period snowfall. Few epiphytes as well as terrestrials are distributed in this zone. The *Bulbophyllum* species (epiphytes), *Calanthe mannii* and *Satyrium nepalense* (both terrestrials) and *Galeola falconeri* (saprophyte) are quiet common in this zone. Alpine zone is snow covered for 4-6 months and a few terrestrial orchids are distributed in this zone.

About 700 species have been reported from North-Eastern India (Kataki *et al.*, 1984; Hegde, 1987); in the state-wise, 324 species in Meghalaya (Kataki, 1986), 500 in Arunachal Pradesh (Hegde, 1984), 453 in Sikkim (Pollunin & Stainton, 1985) and 226 in Mizoram (Singh *et al.*, 1990).

Distribution pattern of Darjeeling and Sikkim Himalayan orchids

Mehra & Vij (1974) studied the ecological adaptations and distribution pattern of Darjeeling and Sikkim Himalayan orchids. They opined that the taxa at lower elevation generally bloom early whereas those at higher altitudes come to flowering later. Epiphytes were abundant in Darjeeling and Sikkim due to high humidity and heavy rainfall, than in the Western Himalaya. Some epiphytes at the lower altitudes, viz., *Coelogyne cristata*, *C. uniflora*, *Cymbidium devonianum*, *C. elegans*, *Pholidota imbricata*, *Thunia alba* etc., were also grown as lithophytes at higher elevations (Mehra & Vij, 1974).

Samant (2002) reported about 244 species from trans-North-West and Western Himalaya. Among genera he reported, *Habenaria* (17 spp.), *Dendrobium* (15), *Bulbophyllum* (11), *Liparis* (10), *Oberonia* (10), *Peristylus* (10) and *Eria* (9) were represented maximum number of species.

The genus *Dendrobium* Sw. with about 104 species is considered to be the largest one followed by *Bulbophyllum* Thou. On the other hand, about 18 genera are monotypics, represented by single species (Singh, 2001).

Sikkim also comes under Eastern Himalaya, is a biogeographic region with magnificent reservoir of biodiversity in general and orchid diversity in particular. The area shares the similar type of floral and faunal

composition with its neighbouring countries such as Bhutan and China (Lucksom, 2007). The altitudinal variation ranges from 380 m at Melli to 8598 m at the top of Mount Kangchendzonga. The average annual rainfall ranges from 2000-2500 mm in the temperate areas of Sikkim, but south district receives comparatively less rainfall and remains almost dry for the most part of the year. Out of 1229 orchid species occurring in India, 523 species is from Sikkim alone (Lucksom, 2007).

From tropical zone of the Sikkim Himalayan region some epiphytic *Dendrobium* species such as *D. formosum*, *D. farmerii*, *D. jenkinsii*, *D. aphyllum*, *D. moschatum* were reported (Lucksom, 2007). Besides, *Bulbophyllum roxburghii*, *B. leptanthum*, *B. cornu-cervi*, *B. tortuosum* are also distributed in this zone. In sub-tropical zone also some epiphytic species such as *B. reptans*, *B. guttulatum*, *B. hirtum*, *Dendrobium moschatum*, *D. densiflorum*, *D. chrysanthum* are distributed. According to Lucksom (2007), having tropical warm humid climate, North Eastern India is conducive for holding maximum number of epiphytes as compared to South India. He has brought out some interesting findings, these are (1) most of *Dendrobium* species require open tree canopy; (2) the natural home for *D. aphyllum* lies between 400-500 m altitude, but now it is found to occupy upto 1700 m; he is of opinion that this vertical climb demonstrated by this species is due to warming of surrounding climate; similarly *D. amoenum* occurring below 1000 m altitude is now seen to grow naturally at Gangtok (Sikkim) at an elevation of 1900 m. According to Lucksom (2007), these are all happened with response to global warming.

Distribution of Orchids in Eastern Ghats

The Eastern Ghats in Andhra Pradesh have been classified into three major regions based on ecological conditions, namely Northern Ghats, Central Ghats and Southern Ghats (Subba Rao, 1997). In general, in Eastern Ghats, a much fewer number of orchids are found when compared to Western Ghats. Some of orchids commonly distributed in Eastern Ghats of India, particularly Andhra Pradesh are *Acampe praemorsa*, *Aerides odoratum*, *A. multiflorum*, *Cymbidium aloifolium*, *Gastrochilus calciolaries*, *Malaxis rheedii*, *Oberonia arnottiana*, *O. brunoniana*, *O. denticulate*, *O. ensiformis*, *o. falconeri*, *Pholidota pallida*, *Vanda spathulata*, *V. tessellata*, *V. testaceae* etc.

Major Threats

Majority of the orchids are becoming error in the nature and many are faced with extinction unless right steps are taken towards their conservation. Our beautiful orchids in this region are in dangerous conditions. The primary cause of the disturbance of the natural habitat of the orchids is trespassed by human population growth which enticed the clearance of forest for agriculture purposes and the construction of new transports. However the deforestation and the usage of firewood by the poor rural people are some other causes for the exhaustion of natural habitat of the orchids. Some of the anthropogenic activities are extension of residential areas habitat degradation as a result of grazing etc. responsible for orchids habitat loss. Natural disasters like landslides and thunderstorms are also the reasons which cogitated for the loss of natural habitat of orchids.

Existing measures of conservation

Very few steps were taken to conserve or kids of this region national parks wildlife sanctuaries biosphere reserves etc have been established. The ultimate storage of biological diversity in natural habitat play prominent role in-situ conservation of orchids. In India Northern region the orchids in Uttarakhand 14.60% Himachal Pradesh 12.80% Jammu and Kashmir 6.60% are the best covered states in India. In the conservation of orchids the most effective mechanism is ex situ method the other important of conservation of orchids are orchidaria in the botanical gardens and the initiation of gene banks. For the research and development of Orchidaria some of the botanic gardens are established in the universities especially in the orchid centers at botany departments. Best example for this orchid centre at botany department Punjab University Chandigarh where Dr wiz and now Pramila Pathak is an energetically associated with the conservation of orchids. Multiplication of orchids by tissue culture is also being done at this centre Hussain etal (2009, 2010,2012, Pathak and vij (1992, 2001 ,2011, 2012) Piri etal 2013 Viz and Pathak (1989, 1992, 2006 2010). The botanical survey of India also maintains the germ plasm of orchids.

Measures to be Adopted to save Green Gold of our Country

The following prominent point should be taken into contemplation prayer to the statement of an area as orchid sanctuary.

1. In India all Universities Botany departments orchidaria should be established.
2. The botany department and research organizations in India should initiate the growing for orchids by tissue culture method.

