

Occurrence of East Himalayan floral elements in the Eastern Ghats of Andhra Pradesh: II. Orchids

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Abstract

The update study on the orchids of Eastern Ghats of Andhra Pradesh by our team revealed the presence of 84 wild orchid species and 56 of them are known to encounter in Eastern Himalayan region of India. The present study provides an enumeration of the 56 species, their growth form and distribution in the Eastern Ghats of Andhra Pradesh. Of the 56 species, 29 are epiphytes, 25 are terrestrial and 2 are saprophytic. Most of the orchids have restricted distribution in the study area confined to one or two districts.

Key words: Eastern Himalaya, Eastern Ghats, Andhra Pradesh Orchids, Distribution

INTRODUCTION

The Eastern Ghats are an assemblage of discontinuous hill ranges, distributed in four Indian states: Orissa, Andhra Pradesh, Karnataka and Tamilnadu. In Andhra Pradesh the Ghats lies between 13° 32' – 18° 20' N latitude and 78° 30' – 84° 08' E longitude. Most of the Ghat forests are distributed in the districts of Srikakulam, Vizayanagaram, Visakhapatnam, East Godavari, West Godavari (all forming the Northern Eastern Ghats of the state), Prakasam, Nellore, Chittoor, Kadapa and Kurnool (the Southern Eastern Ghats). The altitude ranges between 150 and 1680m above MSL. The highest elevation peaks over 1000 m are Armakonda (1680 m), Galikonda (1643 m), Mahendragiri (1501 m), Horsley Hills (1234 m) and Tirumala (1155 m). Mean annual rainfall is 1000 – 1500 mm. The mean annual minimum temperature is 20° C, and maximum is 36° C. Red and black soils dominate the study area. Godavari and Krishna are the major rivers that flow through the terrain. About 30,000 sq km forest area of the state is covered in the Eastern Ghats. Six forest types' viz. Tropical semi-evergreen, moist deciduous, dry deciduous, dry savannahs, dry evergreen and scrub are found in the eco-region. A Centre of Plant Diversity, Nallamalais (WWF& IUCN 1995) and nine wildlife sanctuaries including Gundla-Brahmeswaram and Sri Venkateswara are located in the Eastern Ghats of the state.

The Eastern Himalaya is distributed in Bhutan, North-Eastern India and Nepal. Previously classified as a region within the Indo-Burma biodiversity hotspot, currently the Eastern Himalayas Region now stretches across the Indo-Burma Hotspot and the newly defined Himalaya Hotspot (Conservation International 2005). The Eastern Himalayan region of India lies between the latitudes 26° 40' - 29° 30' N and longitudes 88° 5' - 97° 5' E and covers a total area of 93,988 km² comprising Arunachal Pradesh, Sikkim and Darjeeling hills of West Bengal. Other North-East Indian hills are categorized as Purvanchal Himalaya by Singh (1971). We followed the same concept in the present study. Contrary to Eastern Ghats, the climate of Eastern Himalaya is characterized by cool summer and chilly winter. In most of the places rainfall is quite high and snowfall is quite regular in high altitude areas (>3000 m).

Orchids, one of the largest natural homogenous groups of the plant kingdom are included in a single family Orchidaceae by majority of the authors. The family is considered second largest in plants comprising 880 genera and 21950 species (APG-II 2003), representing 8 % of all the flowering plants. They are cosmopolitan, but the majority of species are found in the tropics and subtropics, ranging from sea level to almost 5000 m elevation in nearly all environments except open water and true desert. They are dominant in nutrient-deficient habitats. More than half of the species are

epiphytic; others are being terrestrial or saprophytic. In general, orchids are most abundant in the tropics and subtropics, but they are also common in the temperate latitudes. The largest number of orchids comes from Asia. Orchids are considered as most evolved group of flowering plants. The structure, the fragrance and the color of the flowers have evolved to help them in the process of reproduction.

The present study attempts to provide the information on the presence of orchids of Eastern Ghats of Andhra Pradesh that are encountered in the Eastern Himalayan region of India.

METHODOLOGY

During our studies in the Eastern Ghats of Andhra Pradesh for the past two decades and intensive explorations in the ongoing research project on Eastern Ghat plant resources as well a thorough perusal of literature pertaining to the study area (Fischer 1928; Karhikeyan, 1989; Pullaiah 1997; Reddy *et al* 2005 & 2008; Sahu *et al* 2007; Pullaiah & Karuppusamy 2008; Raju *et al* 2008; Subba Rao & Kumari 2008) the list of Eastern Ghats orchids have been prepared. The distribution of these orchids was, in turn, checked for their distribution in Eastern Himalaya with the help of available literature (Hara 1966, 1971; Hara *et al* 1978, 1979, 1982; Ohashi 1975).

RESULTS AND DISCUSSION

The update of our studies revealed the presence of 84 orchid species in the Eastern Ghats of Andhra Pradesh. Of these, 56 wild and naturalized taxa have been recognized with their distribution in the Indian part of the Eastern Himalaya. This accounts for the presence of 66 % orchid species of Eastern Ghats common with East Himalayan orchids. Table 1 presented the list of these 56 orchid species along with their distribution pattern in the Eastern Ghat area of Andhra Pradesh. Photographs of some such selected orchids are presented in Plate I. Out of these, 29 are epiphytic, 25 are terrestrial and 2 are saprophytes.

Table 1. Orchids of Indian part of Eastern Himalaya found in Eastern Ghats of Andhra Pradesh [Abbreviations used: GF = Growth Forms; E = Epiphyte; T = Terrestrial; S = Saprophyte]

Name of Species	GF	Distribution in Andhra Pradesh districts in Eastern Ghats
<i>Acampe ochracea</i> (Lindley) Hochr.	E	Vishakapatnam
<i>Acampe praemorsa</i> (Roxb.) Blatt.&McCann	E	Vishakapatnam & Chittoor
<i>Acampe rigida</i> (Buch.-Ham.ex Sm.) P.F.Hunt	E	East Godavari
<i>Aerides multiflorum</i> Roxburgh	E	East Godavari
<i>Aerides odorata</i> Loureiro	E	Vishakapatnam, Godavari
<i>Aphyllorchis montana</i> Reichb.f.	S	Chittoor
<i>Bulbophyllum cariniflorum</i> Reichb.f.	E	Vishakapatnam
<i>Corymborkis veratrifolia</i> (Reinward) Blume	T	Kadapa
<i>Cymbidium aloifolium</i> (L.) Garay	E	Vishakapatnam, East Godavari, Srikakulam and Vijayanagaram
<i>Cymbidium bicolor</i> Lindley	E	Nellore and East Godavari
<i>Dendrobium aphyllum</i> (Roxburgh) C.E.C.Fischer	E	Vishakapatnam, Srikakulam and East Godavari
<i>Didymoplexis pallens</i> Griffith	S	West Godavari
<i>Dienia ophrydis</i> (J. Koenig) Seidenf.	T	East Godavari and Vishakapatnam
<i>Eria bambusifolia</i> Lindley	E	Vishakapatnam
<i>Eulophia explanata</i> Lindley	T	Vishakapatnam, East Godavari
<i>Eulophia graminea</i> Lindley	T	Kadapa
<i>Eulophia spectabilis</i> (Dennst.) Suresh	T	Vishakapatnam and Chittoor
<i>Gastrochilus calceolaris</i> (Buch.-Ham.ex J.J.Sm.) D.Don	E	Vishakapatnam
<i>Geodorum densiflorum</i> (Lam.) Schltr.	T	Throughout

Name of Species	GF	Distribution in Andhra Pradesh districts in Eastern Ghats
<i>Goodyera procera</i> (Wall.ex Ker Gawl.) Hooker	T	Vishakapatnam and Kadapa
<i>Habenaria digitata</i> Lindley	T	Godavari and Nellore
<i>Habenaria furcifera</i> Lindley	T	Srikakulam, Vishakapatnam, Godavari and Chittoor
<i>Habenaria hollandiana</i> Santapau	T	Vishakapatnam, Godavari, Prakasam, Nellore and Kurnool
<i>Habenaria marginata</i> Colebrook	T	Vishakapatnam and Telangana
<i>Habenaria plantaginea</i> Lindley	T	Vishakapatnam, Vijayanagaram, Godavari, Nellore, Prakasam, Krishna and Kurnool
<i>Liparis deflexa</i> Hook.f.	E	East Godavari and Prakasam
<i>Liparis elliptica</i> Wight	E	Vishakapatnam
<i>Liparis viridiflora</i> (Blume) Lindley	E	Vishakapatnam
<i>Luisia trichorhiza</i> (Hooker) Blume	E	Vishakapatnam and East Godavari
<i>Luisia zeylanica</i> Lindley	E	Srikakulam, Vijayanagaram, Vishakapatnam and East Godavari
<i>Malaxis acuminata</i> D.Don	T	East Godavari
<i>Nervilia aragoana</i> Gaudich.	T	Vijayanagaram, Vishakapatnam, East Godavari, Kurnool and Khammam
<i>Nervilia crocififormis</i> (Zoll. & Moritzi) Seidenf.	T	Vishakapatnam, East Godavari
<i>Nervilia plicata</i> (Andrews) Schltr.	T	Vishakapatnam, East Godavari
<i>Oberonia ensiformis</i> (Sm.) Lindley	E	Vijayanagaram, Vishakapatnam, East Godavari
<i>Oberonia falconeri</i> Hook.f.	E	Srikakulam, Vijayanagaram, Vishakapatnam and East Godavari
<i>Oberonia mucronata</i> (D.Don) Ormerod & Seidenf.	E	Vijayanagaram, Vishakapatnam and East Godavari
<i>Papilionanthe teres</i> (Roxburgh) Schltr.	E	Vishakapatnam and East Godavari
<i>Pecteilis gigantea</i> (J.J. Sm.) Raf.	T	East Godavari
<i>Pecteilis susannae</i> (L.) Raf.	T	East Godavari
<i>Peristylus goodyeroides</i> (D.Don) Lindley	T	Kurnool
<i>Peristylus lawii</i> Wight	T	East Godavari
<i>Peristylus parishii</i> Reichb.f.	T	Kurnool
<i>Phalaenopsis parishii</i> Reichb.f.	E	Vishakapatnam
<i>Pholidota imbricata</i> Lindley	E	Vishakapatnam and East Godavari
<i>Pholidota pallida</i> Lindley	E	East Godavari, Vishakapatnam and Srikakulam
<i>Polystachya concreta</i> (Jacq.) Garay & H.R.Sweet	E	Vishakapatnam
<i>Pomatocalpa manii</i> (Reichb.f.) J.J. Sm.	E	Vishakapatnam and East Godavari
<i>Pomatocalpa spicatum</i> Breda	E	Vishakapatnam
<i>Rhynchostylis retusa</i> (L.) Blume	E	Srikakulam, Vishakapatnam and East Godavari
<i>Satyrium nepalense</i> D. Don	T	East Godavari
<i>Spiranthes sinensis</i> (Persoon) Ames	T	Vishakapatnam
<i>Tropidia angulosa</i> (Lindley) Blume	T	East Godavari
<i>Vanda tessellata</i> (Roxb.) Hooker ex G. Don	E	Throughout
<i>Vanda testacea</i> (Lindley) Reichb.f.	E	Srikakulam, Vijayanagaram, Vishakapatnam, East Godavari, Chittoor and Khammam
<i>Zeuxine strateumatica</i> (L.) Schltr.	T	Vijayanagaram, Srikakulam, Anantapur and Kadapa

Only two orchid species are found common in the Eastern Ghat area. North Eastern Ghats with relatively humid climate support as many as 51 East Himalayan orchid species. Southern Eastern Ghats with dry climate support only 17 species. Interestingly in North Eastern Ghats, 22 Eastern Himalayan orchid elements have restricted distribution in one district, of which 10 are confined to Vishakapatnam district; 7, East Godavari, 2, in Kurnool; 1 each in West Godavari, Kadapa and Chittoor districts. It is evident that over 90 % of orchids of Eastern Ghats of Andhra Pradesh are located in relatively high altitude (above 1000 m) moist deciduous forests of North Eastern Ghats indicating their dominance in humid forests.

PLATE I: Photographs of some Eastern Himalayan orchids in Eastern Ghats.



Cymbidium aloifolium



Eulophia graminea



Geodorum densiflorum



Habenaria plantaginea



Luisia zeylanica



Pholidota pallida



Vanda tessellata



Vanda testacea

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