

Note on the orchids of new forest campus of Dehradun (Uttarakhand, India)

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Abstract

The present study on orchids of new forest campus of Dehradun, Uttarakhand is the outcome of several field surveys carried out in different habitats from January 2019 to July 2022. A total of 7 species of epiphytic orchids divided into 7 different genera have been recorded, including three orchids never recorded at the site.

Key words: host species, microclimate, orchid diversity.

Introduction

The state Uttarakhand is bestowed with orchid diversity with the highest number of orchid species in Western Himalaya. The orchid study in the state was earlier carried out by many renowned botanists such as Duthie, 1906; Raizada *et al.*, 1981; Seidenfaden & Arora, 1982; Deva & Naithani, 1986; Pangtey *et al.*, 1991 and many others to document the orchid flora of the region. Uttarakhand was earlier part of undivided Uttar Pradesh and later bifurcated out as a state in the year 2000.

The first taxonomic orchid flora of the state Uttarakhand was published by Jalal *et al.* (2008) who reported 237 species belonging to 71 genera. A bit later, Jalal (2012) reported 240 species belonging to 73 genera and during the study he identified certain localities as being rich in orchids. During his study it was revealed that the diversity of terrestrial orchids in the state was greater than that of epiphytic orchids.

Dehradun lies in the famous Doon valley which is known for its rich biodiversity. The valley of Doon is surrounded by Shiwalik Himalaya in south-west and Lesser Himalaya in north-east direction. About 52% of the Doon valley consists of subtropical deciduous forest with a high abundance of Sal trees (*Shorea robusta* Gaertner) (Mandal & Joshi, 2014). The Dehradun district consists of 15 forest types (Champion & Seth, 1968) however major part is dominated by Sal forest and the latter can be further classified into Doon valley Sal and Shiwalik Sal. Philip W. Mackinnon, a plant collector from the Natural History Museum, as well as some eminent botanists including Mukut Bihari Raizada, Harsh Bardhan Naithani, Hari Om Saxena, Som Deva have made a significant collection of orchids collected from the Dehradun region and visible in the FRI herbarium.

Study area

The study carried out in new forest campus, Dehradun covers an area of 4.5 km² located between 77°59' & 78°01' E longitude and 30°20' & 30°21' N latitude, and elevation is 640 meters above mean sea level (fig. 1). To the North the area is limited by the Tons river, to the South by Chakrata Road, to the East by Kaulagah area and to the west by Indian Military Academy. The habitat is a mosaic of anthropogenic habitation (buildings and colonies) along with natural forest and plantation. The Forest Research Institute (FRI) famous for forestry research and education in India is located in this campus. Annual rainfall is 2000 mm, with temperature up to 42°C during summer and below 0°C during winter months. The new forest campus is rich in floral diversity with 267 species of trees, 214 species of shrubs, 446 species of herbs, 41 species of woody climbers, 32 species of bamboos and 186 species of fungi (FRI, 2019). (Fig. 2).

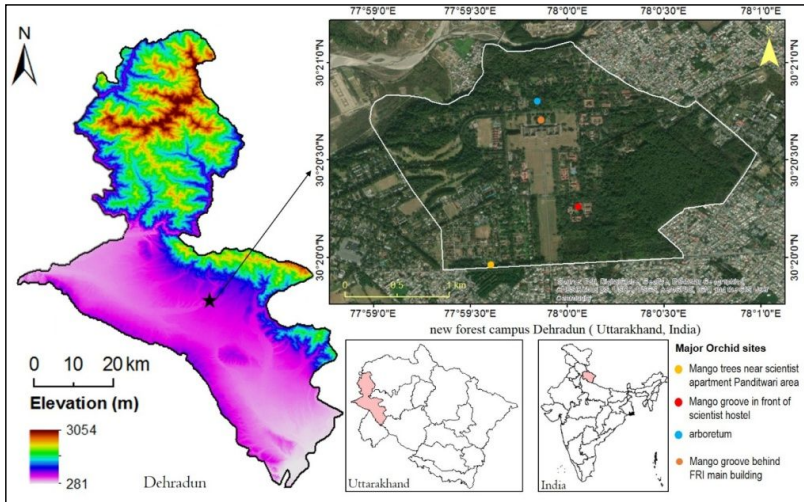


Figure 1: Location map of new forest campus, Dehradun.



Figure 2: Different views of the orchid habitats of new forest campus, Dehradun. Photos Divesh Pangtey & Siddharth Machado.

Materials and Methods

The field survey was carried out from January 2019 till July 2022 by visiting the different areas (road side habitat, FRI canal bank, reserve forest, grassy grounds, areas of anthropogenic habitats, etc.) on different seasons. The specimens collected in the flowering and fruiting stages were processed and mounted on herbarium sheets following the standard methods of Jain & Rao (1977). They were identified with the help of relevant literature of King & Pantling, 1898; Pradhan, 1976; 1979; Raizada *et al.*, 1981; Deva & Naithani, 1986; Chowdhery, 1998; Pearce & Cribb, 2002; Chen *et al.*, 2009; Gogoi, 2018, 2019; Misra, 2019; Singh *et al.*, 2019; Gogoi *et al.*, 2022 and by matching with the Herbarium of Forest Research Institute, Dehradun and Digital Herbarium of Botanical Survey of India. The collected specimens were deposited in the herbarium of TOSEHIM, Regional Orchids Germplasm Conservation & Propagation Centre (Assam).

Results

While browsing the herbarium of the Forest Research Institute, Dehradun (DD), we found some species of orchids, collected in the new forest of the campus, and which we could not observe during our study. These are shown in Table 1.

Table 1: Orchid species collected earlier from new forest of Dehradun. Abbreviations used: H-habit [E-epiphytic, T-terrestrial]; DD-(Forest Research Institute. Herbarium accession number with year of collection).

	Taxon	H	DD
1.	<i>Acampe praemorsa</i> (Roxburgh) Blatter & McCann	E	1974, <i>Ram Dayal 150173</i>
2.	<i>Aerides multiflora</i> Roxburgh	E	1936, <i>Raizada 72536</i> ; 1954, <i>Raizada 116494</i> ; 1972, <i>Naithani 147436</i>
3.	<i>Aerides odorata</i> Loureiro	E	1954, <i>Raizada 116493</i>
4.	<i>Cleisostoma racemiferum</i> (Lindley) Garay	E	1938, <i>Raizada 77845, 77846</i>
5.	<i>Eulophia herbacea</i> Lindley	T	1942, <i>Raizada 92566</i>
6.	<i>Peristylus plantagineus</i> Lindley	T	1939, <i>Raizada 81910</i>
7.	<i>Rhynchostylis retusa</i> (Linnaeus) Blume	E	1955, <i>Balpure 113578</i> ;1969, <i>Ram</i>

			<i>Dayal 150171</i> 1984, Jain <i>153651</i>
8.	<i>Vanda testacea</i> (Lindley) Reichenbach f.	E	1984, Jain <i>153651</i> ; 1984, <i>Naithani 154860</i>

To this list we can add three species of epiphytic orchids that we have identified in the study area and have never been mentioned before. Seven species in total have been observed. Four sites were found to be more diverse and richer in orchid population: Mango groove in front of scientist hostel; Mango trees near scientist apartment Panditwari area; Mango groove behind FRI main building and arboretum. Orchids are also sparsely recorded from road side trees of jacaranda road, chaturvedi road, hill road, hospital road, reserve forest, botanical garden, wild trek, ecology division etc. The most favorable host species is found to be *Mangifera indica* Linnaeus (trunks and branches). There are also other host species in the area for example *Jacaranda mimosifolia* D. Don, *Cassia fistula* Linnaeus, *Litsea monopetala* (Roxburgh) Persoon, *Tectona grandis* Linnaeus, *Kigelia africana* (Lamarck) Benthams, *Haldina cordifolia* (Roxburgh) Ridsalde, *Lagestroemia speciosa* (Linnaeus) Persoon, *Artocarpus heterophyllus* Lamarck, *Terminalia alata* Benjamin Heyne ex Roth, *Ficus sp* Linnaeus. The orchid species habit, status in the study site, flowering and fruiting are presented in the table 2.

Table 2: List of orchid species recorded from new forest campus of Dehradun. Abbreviations used: H-habit; E-epiphytic; F-flowering time; no-voucher number; S-status at study area (V-very rare, R-rare, C-common); Fig: figure.

	Taxon	H	F	no	S	Fig.
1.	<i>Acampe praemorsa</i> (Roxburgh) Blatter & McCann	E	October-January	FRI0058	C	3A
2.	<i>Aerides multiflora</i> Roxburgh	E	March-August	FRI0021	C	3B
3.	<i>Luisia trichorrhiza</i> (Hooker) Blume	E	March-August	FRI0027	C	-
4.	<i>Oberonia falconeri</i> Hooker	E	September-December	FRI0054	V	3C
5.	<i>Rhynchostylis retusa</i> (Linnaeus) Blume	E	May-August	FRI0035	R	3D
6.	<i>Smitinandia micrantha</i> (Lindley) Holttum	E	June-August	FRI0081	V	3E
7.	<i>Vanda testacea</i> (Lindley) Reichenbach f.	E	May-August	FRI0043	C	3F

Discussion

All the species recorded are epiphytic orchid. During the present study, after carrying out repeated surveys, we did not find any terrestrial orchid in our study site. It may be due to anthropogenic activities (constructions, cutting of grasses and weeds in campus for cleaning the area, clearing of forest floor during summer to avoid forest fire), natural (change in climatic conditions).

Oberonia falconeri, *Luisia trichorrhiza* and *Smitinandia micrantha* are three species that have never before been recorded on the campus. We have not been able to make, even after repeated surveys carried out in the favorable habitats, new observations of *Aerides odorata*, *Cleisostoma racemiferum*, *Eulophia herbacea* and *Peristylus plantagineus*. The habitat of orchids is depleting day by day due to continuous anthropogenic development activities. The new forest campus is very suitable orchid habitat due to its unique microclimate and with assemblage of different kinds of vegetation. In new forest campus the orchid rich habitat areas should be conserved. If a host tree is being destroyed by pest/fungal attack or by storm (lightening etc.) or being felled the branches being lopped then the orchids species present there should be relocated to other host tree so that they are conserved without affecting their populations.

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Figure 3: Some orchids of new forest campus, Dehradun. A – *Acampe praemorsa*; B – *Aerides multiflora*; C – *Oberonia falconeri*; D – *Rhynchostylis retusa*; E – *Smitinandia micranta*; F – *Vanda testacea*. Photos Khyanjeet Gogoi, Nayan Jyoti Gogoi & Siddharth Machado.

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