

# Diversity of the Genus *Dendrobium* schwartz in Dhemaji District, Assam, India

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## ABSTRACT

Orchidaceae is the largest and most advanced family among Monocotyledons having almost 763 genera and 25000-30000 species. In India, the North East region is very rich in orchid diversity. Around 411 species of orchids are reported from Assam. The present paper includes details of survey work carried out between the 2018-2019 to find out the diversity of *Dendrobium* species in Dhemaji District of Assam. A total 12 species of *Dendrobium* have been identified. The paper also comprises some traditional uses of the reported species.

**Key words:** Orchids, *Dendrobium*, Diversity, Assam

## Introduction

The orchidaceae are a diverse and widespread group of family with flowers that are colourful and fragrant. The family orchidaceae having 763 genera with 25000-30000 species are distributed throughout the world (Christenhusz *et al.*, 2016).

Orchids are easily distinguishable from other plants as they show some distinct characteristics which includes bilateral symmetry of flower (zygomorphism), a nearly always highly modified petal (labellum), fused stamen and carpel (gynostagium) and extremely small seeds (Haw, 2017).

Orchids are of two types based on their growth types i.e., Monopodial and Sympodial (Arditti, 1992). Orchids that grow from a single stem are called monopodial; they have aerial roots and stem will grow indefinitely. Sympodial orchids which are the more common of the two orchid types, grow lat-

erally and have stems that are bulb like and are called pseudobulb (Sailo *et al.*, 2014).

In India, the orchid rich regions are the North-Eastern region, particularly the Eastern Himalaya, Meghalaya, Mizo, Lushai hills and the Naga hills, Assam, Arunachal Pradesh, Sikkim in particular rich with orchids; North-Western Himalayan region and also Western Ghats (Singh, 2019). A total 1256 no of orchid species are found in India out of which around 411 species of orchids are reported from Assam (Singh, 2019; Gogoi *et al.*, 2022).

*Dendrobium* is the second largest genus of the family Orchidaceae having 1600 species and is widespread throughout Southeast Asia to Australia (De *et al.*, 2015). *Dendrobium* species are mostly epiphytic or lithophytic although a few species are terrestrial. They are usually much longer than wide and last for only a single season. Flowers are 1-2 inch in length consist of 3 sepals and 2 petals and lip or labellum. The flowers may be white, green, yel-

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low or pink to purple often with contrasting colors in the labellum (Nie *et al.*, 2018).

In India, *Dendrobium* is represented by 110 species distributed throughout the Eastern Himalayas, Western Himalayas, Western Peninsular, Andaman and Nicobar Island (Singh *et al.*, 2001; Choudhury, 2008). Out of these 110 species, 77 species are reported from North Eastern Region (Singh *et al.*, 2001). However, Lokho (2013), studied the diversity of *Dendrobium* in Northeast and a total 82 species were recorded from this region. Among the states of Northeast, Arunachal Pradesh has the highest diversity of *Dendrobium* with 49 species and Assam has 46 species. Out of these 82 species, 46 are native to Northeast and remaining 36 species are common with the rest of the country. The present study focuses on finding the diversity and distribution of *Dendrobium* in Dhemaji District.

### Study area

Dhemaji District is situated in the remote corner of North East India on the north bank of river Brahmaputra. The boundaries of the district are the hilly ranges of Arunachal Pradesh to the North and the East, Lakhimpur district in the West and the river Brahmaputra in the South.

The Dhemajidistricts geographically situated between the 94° 12' 18" E and 95° 41' 32" E longitudes and 27° 05' 27" N latitudes and covers an area of 3237 Sq. Km and is a basically plain area lying at an altitude of 104 m above the Mean Sea Level. The district is very rich in plant biodiversity and has a great traditional knowledge based in plant resources. Different tribes in Dhemaji district have

some traditional health care practices using different species of plants.

The survey covered various parts of Dhemaji District. The main study areas were: Bordoloni, NHPC (Gugamukh); Forest area of Jiadhah, Jayrampur, Town Area of Dhemaji, some villages of Dhemaji (Balijaan, guwalsapori, Lachit Nagar, Kaitang, Nalanipam, Karichuk and 2.no. Bharali Chuk), Kamchi, Some areas of Silapathar such as MaduriPathar, Khanamukh, Silapathar Science College Orchidarium (Amritpur) and Poba Reserve Forest (Jonai).

### Materials and Methods

The diversity study is carried out from year 2018-2019 and based on field survey in different parts of the district. Interactions with the local people was done to know some traditional use of the species. Visiting Nurseries such as Orchid nursery of Tankeswar Doloi, Nursery of Gautam Goswami helped a lot in study of some species. The identification of species was done with the help of some standard books such as Orchid of Assam by Khyanjeet Gogoi, Orchids of Arunachal Pradesh by Sadanand N. Hegde, Ngilyang Tam, Jambey Tsering and Ona Apang etc. The accepted names were given according to World Checklist of Monocotyledons (Govaerts, 2003).

### Results and Findings

*Dendrobium* Schwartz belongs to sub family Epidendroidae; tribe Dendrobieae and sub tribe Dendrobiinae.

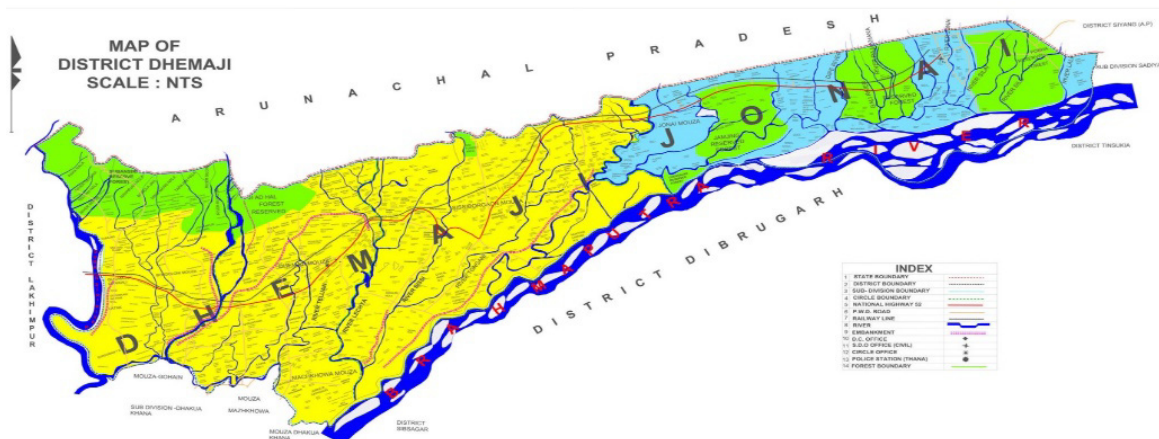


Fig. 1. Map of the study area.

A total 12 species of *Dendrobium* were recorded from Dhemaji district viz. *Dendrobium aphyllum* (Roxb.) C.E.C. Fisch, *D. aduncum* Lindl., *D. acinaciforme* Roxb., *D. chrysanthum* Wall.ex. Lindl., *D.chrysotoxum* Lindl., two varieties of *D. fimbriatum* Hooker, i.e. *D. fimbriatum* var. *oculatum* and *D.fimbriatum* var. *fimbriatum*, *D.jenkinsii* Wallich ex Lindl, *D.lituiflorum* Lindl., *D. moschatum* (Buch. Ham.) SW., *D. nobile* Lindl., *D.sulcatum* Lindl. and *D. Transparens* Lindl.

The main reason of choosing this was that the flowers are very colorful and have labellum with contrasting colors. Secondly, *Dendrobium* is the second largest genus of Orchidaceae family. The diversity is very high among the species of this genus. The occurrence of these species also varies greatly. Among these species some are very common while some are rarely found in some specific area. The species *D. aphyllum* (Roxb.) C.E.C.Fisch., *D.moschatum* (Buch. Ham.) SW., *D.fimbriatum* var.

**Table 1.** Species of *Dendrobium* reported from Dhemaji District along with their traditional uses.

Sl. No.	Species	Flowering time	Flower color	Color of labellum	Occurrence	Traditional uses
1	<i>D. acinaciforme</i> Roxb.	April-May	Creamy white	Yellow	Rare	Unknown
2	<i>D. aduncum</i> Lindl	June	Pink-purple	White (anther lobes dark purple)	Rare	Unknown
3	<i>Dendrobium aphyllum</i> (Roxb.) C.E.C.Fisch	March- July	Pink- pale purple	Pale yellow	Very common	Leaves used in skin disease
4	<i>D. chrysanthum</i> Wallich ex Lindl.	July- september	Yellow	Yellow, chestnut blotch on either side	Rare	Unknown
5	<i>D. chrysotoxum</i> Lindl.	May-August	Golden yellow	Deepgolden yellow, red stripes on each side	Rare	Unknown
6	<i>D.fimbriatum</i> var. <i>fimbriatum</i>	April - May	Bright orange yellow	Lip without dark maroon blotch	Rare	Unknown
7	<i>D. fimbriatum</i> var. <i>oculatum</i>	April- May	Bright orange yellow	Lip with dark maroon blotch	Common	Leaf extract used as tonic
8	<i>D. jenkinsii</i> Wallich ex Lindl	May -august	Yellow	Yellow Orange	Rare	Unknown
9	<i>D. lituiflorum</i> Lindl.	March- May	Purple	Deep purple spot with a white circle	Common	Used as hair ornament
10	<i>D. moschatum</i> (Buch. Ham.) SW.	May – july	Pinkish yellow	Yellow to white with 2 purple-red spots	Common	Dried stem use to make baskets.
11	<i>D. nobile</i> Lindl	April - June	White with purple tip	Purple at tip, deep purple central blotch is present	Rare	Unknown
12	<i>D. sulcatum</i> Lindl.	April -August	Golden yellow	Orange yellow with red stripes	Rare	Unknown
13	<i>D. transparens</i> Lindl.	April-July	White	White with purple patches	Common	Paste of leaves used to cure dislocated bones



Fig. 2. A-*Dendrobium aphyllum* (Roxb.) C.E.C.Fisch., B-*D. chrysanthum* Wall.ex.Lindl., C-*D.chrysotxum* Lindl., D-*D.fimbriatum* var. *fimbriatum*, E- *D. fimbriatum* var. *oculatum*, F-*D. jenkinsii* Wallich ex Lindl, I., G- *D. lituiflorum* Lindl., H-*D. moschatum* ( Buch. Ham.) SW., I -*D. nobile* Lindl., J- White coloured *D. nobile* Lindl., K-*D. sulcatum* Lindl., AndL-*D. transparens* Lindl.

*oculatum*, *D.lituiflorum* Lindl., *D.transparens* Lindl. are seen distributed throughout the district. While, *D.chrysotxum* Lindl., *D.jenkinsii* Wallich ex Lindl. are not very commonly found. The species- *D. acinaciforme* Roxb., *D. aduncum* Lindl., *D.sulcatum* Lindl., *D.fimbriatum* var. *fimbriatum* and *D. nobile* Lindl. are rarely found. Most of the species blooms during spring season at the time of Bohag Bihu. *D.chrysanthum* Wall.ex. Lindl. blooms during late summer to early winter. *D.moshchatum*( Buch. Ham.) SW., *D.sulcatum* Lindl. and *D.jenkisii* Wallich ex Lindl. blooms during May-July i.e. late spring.

Out of these 12 species, yellow flowered *Dendrobium* dominates the diversity. Purple colored *Dendrobium* such as *D.lituiflorum* are found greatly throughout Dhemaji. A white colored *D. nobile* is also found on the forests of Balijan area. All of the reported species are epiphytic in nature. The traditional knowledge of some species were still unknown as they are specifically found in the forest areas of the district.

## Conclusion

Now-a-days orchids are grown for both their economical and traditional value. *Dendrobium* are cultivated as ornamental plant for their bright and colorful flowers. From the present study it is known that Dhemaji District has a high diversity of *Dendrobium* along with other 67 genera's (Gogoi *et al.*, 2022). The aim was to find out the various species of *Dendrobium* which are found naturally in and around Dhemaji District. As the field work only carried out for only one year therefore the study covered few places and many places were remained to visit. Further work on this topic is necessary for more detailed information regarding this genus. Although Dhemaji district provides a suitable environment for growth and propagation orchid, there are various factors that are a threat to the orchid population of the area. Anthropogenic actions such as habitat destruction; collection of timbers and firewood for daily uses; use of medicinal plants, other ornamental plants or orchid etc. for trading purpose by the local peoples of nearby forest area and envi-

ronmental factors such as flood have been greatly affecting the orchid flora of the district. As some of the recorded species are very rarely found and only confined to a particular area, therefore conservation of these species in their natural habitat needs utmost attention.

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