

Diversity of *Dendrobium* Sw. Its Distributional Patterns and Present Status in the Northeast India

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Abstract- The family Orchidaceae is one of the largest groups among the angiosperms and distributed throughout the world. The genus *Dendrobium* is the second largest group among the orchid plant in India and exhibit diverse shapes, colour and morphological characters. They are widely distributed throughout the Northeastern states and recorded with 82 species from the region. The highest number of occurrence with 49 species has been recorded in Arunachal Pradesh and the least number with 5 species in Tripura state from the region. The present analysis reveals 71.95 per cent of the species require attention for conservation, 36.58 per cent of the total species are widely distributed throughout the region, while 26.89 per cent of the species are endemic confining to a particular state.

Index Terms- Orchidaceae, *Dendrobium*, Diversity, Status.

I. INTRODUCTION

Biodiversity is used as a synonym of species diversity or species richness. In Orchid the extreme degree of morphological variability is attributed to genetic drift (Brieger, 1975). Species diversity is an important aspect of biodiversity as genetic diversity often evolves as a result of the interactions between different individuals of the same species and sometimes other subsystem species. Thus, species are the central object to the concept of biodiversity and the knowledge of species taxonomy is the current currency of biodiversity (Heywood, 1996). A biodiversity study comprises the systematic examination of the full array of different kinds of organisms together with the technology by which the diversity can be maintained and used for the benefit of humanity (Paul and Edward, 1991). Hence, conservation of biodiversity and its taxonomic studies for sustainable development is the focused for proper management in the present context.

The Orchidaceae is one of the largest families of flowering plant distributed throughout the world and the greatest diversity occurs in the tropical and sub-tropical climate. The estimated number of species varies from 12000 to 35000 (Fiveash, 1974; Sanford, 1974; Alphonso, 1975; Hunt, 1984; Heywood, 1985; Dressler, 1993), contributing up to 10% of all flowering plants species in the world (Dressler, 1981). A large variety of orchids are found in India, and the numerical strength in terms of species varies from 800 to 1500, which makes India one of the richest orchid floras in tropical Asia (Kumar and Manilal 1990; Dressler, 1981; Joseph, 1982; Santapau and Henry, 1973; Bose and Bhattacharjes 1980. There are also some works on orchid flora of the region by Pradhan (1979) for Sikkim; Kataki (1984) for Meghalaya; Hegde (1984) for Arunachal Pradesh; Chankija *et al.*, (1992) for

Nagaland; Singh *et al.*, (1990) for Mizoram; Chowdhury (1998); Singh (1999); Khyanjeet Gogoi *et al.*, (2012); Chaya Deori *et al.*, (2009); Khyanjeet Gogoi (2011); Bhattacharjee & Dutta (2010); Borgohain *et al.*, (2010); Lucksom (2007); Rao (2010); Rao (2007) and Khyanjeet Gogoi *et al.*,(2012).

In the recent past, from the statistical analysis of the angiospermic flora it has revealed that the family Orchidaceae with 184 genera and 1,229 species forms the second largest family of flowering plants in India (Karthikeyan, 2000). The fascination of an orchid flower is the mimicking of the animals morphology and anatomy parts, like wasps, bees, moths, lizards, butterflies, swans, doves and even human form. Besides of its morphological variability and uniqueness in beauty adorned with sweet fragrances they constitute prized ornamentals in floriculture all over the world. The orchids are popular among the horticulturist for its immense potential market for trade in floriculture industry because of its exquisite beauty.

The Northeast region lies between 22.30°N latitude and 80.97°E longitude and is bordered by China in the north, Bhutan in the west, Bangladesh in the south and Myanmar in the east. The Northeast India falls under the Eastern Himalayas and comprised of eight states viz., Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura, occupies a total geographical area of 2,62,251 km², possesses a great diversity in physiographic and climatic conditions. The region is also known for its diverse cultures, ethnic groups and one of the mega-biodiversity zones in the world. The northeast India accounts for about 750-876 species of orchids under 151 genera (King & Pantling, 1898; Pradhan, 1976, 1979; Kataki, *et al.*, 1984; Hegde, 1987a; Jain 1985; Sharma, 1993; Chowdhery, 1998; Mao & Hynniewta, 1999; Hynniewta, 2000) which are distributed in different parts of the region.

The genus *Dendrobium* is the second largest group in Orchidaceae with 900 species (Dressler, 1993) and widely distributed in the countries like India, China, South East Asia, Japan, Malaya, Philippines, New Guinea, Australia, Pacific Islands and New Zealand, with highest concentration of more than 150 species in Papua New Guinea. The numerical strength of the genus in terms of species has been variously estimated between 900 and 1600 (Holttum, 1957; Hooker, 1890; Santapau and Henry, 1973; Willis, 1973; Hawkes, 1970). As, the genus is very large, biologically diverse and taxonomically complex, it has been variously segregated into sections and sub-sections at different time by different workers (Lindley, 1840; Bentham, 1881; Hooker, 1896; King and Pantling, 1898; Kranzlin, 1910; Schlechter, 1926; Seidenfaden, 1985; Dressler, 1993). In India, it is the second largest genus among the orchid and represented by 103 species distributing in the Eastern Himalayas, Western Himalayas, Western Peninsular, Andaman and Nicobar Island

(Singh *et al.*, 2001). Although the general account and occurrence of Indian *Dendrobium* have been documented right from the old literature on Indian orchid there is no such comprehensive accounts on *Dendrobium* in India and in particular to northeast India where maximum number of species are distributed. Therefore, a survey on biodiversity of North-East *Dendrobium* its distribution and present status has taken up for the present study.

Methodology

The diversity study is based on field survey, collection of specimens from various parts of the region and literature survey.

For collection and pressing and preparation of herbarium specimens, the methods suggested by Jain and Rao (1977) were followed with suitable modifications. The specimens are identified with the help of published literature such as regional floras, standard books and with the consultation of herbarium specimens of Botanical Survey of India (BSI) herbarium (ASSAM) Shillong. The specimens are deposited in the herbaria of Botany department (NEHU), Shillong. The accepted names and its synonyms were given according to the World Checklist of Monocotyledons (Govaerts 2003).

Table 1. Distributional Patterns of *Dendrobium* Species in Northeast India:

** = Synonym; +=Present; - = Absent

** ArP=Arunachal Pradesh; Assm=Assam; Manip=Manipur; Megh=Meghalaya; Mizo=Mizoram; Naga=Nagaland; Sikkim=Sikkim; Trip=Tripura.

Sl. No.	Name of the Species	**Name of the States in North Eastern Region India								Status/Category
		ArP	Assm	Manip	Megh	Mizo	Naga	Sikkim	Trip	
1	<i>Dendrobium acinaciforme</i> Roxb.	+	+	+	+	+	+	-	-	
2	<i>Dendrobium aduncum</i> Wall. ex Lindl.	+	+	+	-	-	-	+	-	Rare , Threatened, Endangered
3	<i>Dendrobium angulatum</i> Lindl. ** <i>D. podagraria</i> Hook.f.	+	-	-	-	-	-	-	+	Rare
4	<i>Dendrobium amoenum</i> Wall. ex Lindl.	+	-	-	-	-	-	+	-	
5	<i>Dendrobium anceps</i> Sw.	+	+	+	+	+	+	+	-	
6	<i>Dendrobium aphyllum</i> (Roxb.) Fischer ** <i>D. pierardii</i> Roxb. ex Lindl.	+	+	+	+	+	+	+	-	
7	<i>Dendrobium aphyllum</i> (Roxb.) Fischer var. <i>katakianum</i> Iswar Barua	-	+	+	-	-	+	-	-	Rare
8	<i>Dendrobium dickasonii</i> L.O. Williams ** <i>D. arachnites</i> Rchb.f.	-	-	+	-	+	-	+	-	Rare
9	<i>Dendrobium arunachalense</i> C. Deori et al.	+	-	-	-	-	-	-	-	Rare, Threatened

Sl. No.	Name of the Species	**Name of the North Eastern Region								Status/Category
		ArP	Assm	Manip	Megh	Mizo	Naga	Sikm	Trip	
10	<i>Dendrobium assamicum</i> S. Chowdhury	-	+	-	-	-	-	-	-	Very Rare
11	<i>Dendrobium bellatulum</i> Rolfe.	-	-	+	-	-	-	-	-	Rare, Threatened
12	<i>Dendrobium bensonae</i> Rchb.f.	-	-	+	-	+	+	-	-	Rare
13	<i>Dendrobium bicameratum</i> Lindl.	+	-	-	+	+	+	+	-	Rare, Threatened, Endangered
14	<i>Dendrobium brymerianum</i> Rchb.f.	-	-	+	-	-	-	-	-	Rare
15	<i>Dendrobium moniliforme</i> (L) Sw. ** <i>D. candidum</i> Wall. ex Lindl.	+	+	+	+	-	+	+	-	Rare, Threatened, Endangered
16	<i>Dendrobium capillipes</i> Rchb.f.	-	-	+	-	+	-	-	-	Rare
17	<i>Dendrobium cariniferum</i> Rchb.f.	-	-	+	-	+	-	-	-	Rare, Threatened
18	<i>Dendrobium salaccense</i> (Blume) Lindl. ** <i>D. catchartii</i> Hk.f.	+	+	-	+	+	-	+	-	Rare, Threatened
19	<i>Dendrobium chrysanthum</i> Lindl.	+	+	+	+	+	+	+	-	
20	<i>Dendrobium chryseum</i> Rolf. ** <i>D. aurantiacum</i> Rchb.f.	-	-	+	+	-	-	+	-	Rare, Endangered, Threatened
21	<i>Dendrobium chrysotoxum</i> Lindl.	+	+	+	-	+	+	-	+	Rare, Endangered, Threatened
22	<i>Dendrobium denneanum</i> Kerr, J. ** <i>D. clavatum</i> Roxb.	-	-	+	-	-	-	-	-	
23	<i>Dendrobium crepidatum</i> Lindl. & Paxt.	-	-	+	+	+	+	+	-	Rare, Threatened, Endangered
24	<i>Dendrobium cretaceum</i> Lindl.	+	+	-	+	+	-	-	-	
25	<i>Dendrobium cumulatum</i> Lindl.	+	+	-	+	-	-	+	-	Rare, Threatened, Endangered
26	<i>Dendrobium darjeelingensis</i> Pradhan	-	+	-	-	-	-	-	-	Very Rare
27	<i>Dendrobium densiflorum</i> Lindl.	+	-	+	+	+	+	+	-	
28	<i>Dendrobium denudans</i> D. Don.	+	-	-	-	+	+	+	+	
29	<i>Dendrobium devonianum</i> Paxt.	+	-	+	+	+	+	+	-	Threatened

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		ArP	Assm	Manip	Megh	Mizo	Naga	Sikm	Trip	
30	<i>Dendrobium draconis</i> Rchb.f.	-	-	+	-	-	-	-	-	Rare
31	<i>Dendrobium eriiflorum</i> Griff.	+	+	+	+	-	+	+	-	Rare, Threatened
32	<i>Dendrobium falconeri</i> W.J. Hook.	+	+	+	+	+	+	+	-	Rare, Threatened, Endangered
33	<i>Dendrobium farmeri</i> Paxt.	+	+	+	+	-	-	+	-	Very Rare
34	<i>Dendrobium fimbriatum</i> Hook.	+	+	+	+	-	-	+	-	
35	<i>Dendrobium fimbriatum</i> Var. <i>occulatum</i> Hook	+	-	+	-	-	-	+	-	
36	<i>Dendrobium formosum</i> Roxb. ex Lindl.	+	+	+	+	+	-	+	-	Endangered, Threatened
37	<i>Dendrobium graffithianum</i> Lindl	-	+	-	-	-	-	-	-	Rare
38	<i>Dendrobium gibsonii</i> Lindl.	+	-	+	+	+	-	+	-	Rare, Threatened, Endangered
39	<i>Dendrobium gratiosissimum</i> Rchb.f.	-	-	+	-	-	-	-	-	Rare
40	<i>Dendrobium heterocarpum</i> Wall. ex Lindl. ** <i>D. aureum</i> Lindl.	+	-	+	+	+	+	+	-	
41	<i>Dendrobium hookerianum</i> Lindl.	+	+	-	+	+	+	+	-	
42	<i>Dendrobium infundibulum</i> Lindl.	-	-	+	-	+	-	+	-	
43	<i>Dendrobium jaintianum</i> Sabap.	-	-	-	+	-	-	-	-	Rare, Threatened
44	<i>Dendrobium jenkinsii</i> Wall. ex Lindl.	+	+	+	+	+	-	+	-	Rare, Threatened, Endangered
45	<i>Dendrobium khasianum</i> Deori	-	-	-	+	-	-	-	-	Very Rare, Endangered
46	<i>Dendrobium keithii</i> Ridl.	-	+	-	-	-	-	-	-	
47	<i>Dendrobium kentrophyllum</i> Hook.f.	+	+	-	-	-	-	-	-	Rare
48	<i>Dendrobium lindleyi</i> Steud. ** <i>D. aggregatum</i> Roxb.	+	+	-	+	+	+	+	-	
49	<i>Dendrobium linguella</i> Rchb.f.	-	-	+	-	-	-	-	-	Rare
50	<i>Dendrobium lituiflorum</i> Lindl.	+	+	-	-	+	-	-	-	
51	<i>Dendrobium</i>	+	-	-	+	+	+	+	-	Rare, Endangered,

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		ArP	Assm	Manip	Megh	Mizo	Naga	Sikm	Trip	
	<i>longicornu</i> Lindl.									Threatened
52	<i>Dendrobium meghalayense</i> Y. Kumar & S. Chowdhury	-	-	-	+	-	-	-	-	Rare, Threatened
53	<i>Dendrobium miserum</i> Rchb.f.	-	+	-	-	-	-	-	-	Rare
54	<i>Dendrobium monticola</i> P.E.Hunt & Summerh. ** <i>D. alpestre</i> Royle.	+	-	-	-	-	-	-	-	Rare
55	<i>Dendrobium moschatum</i> (Buch. Ham.) Sw. ** <i>D. calceolaria</i> Carey ex Hook.	+	+	+	+	+	+	+	-	Rare, Threatened, Endangered
56	<i>Dendrobium mannii</i> Ridl.	+	+	-	-	-	-	-	-	Rare
57	<i>Dendrobium nareshbahadurii</i> Naithani	+	-	-	-	-	-	-	-	Rare
58	<i>Dendrobium nobile</i> Lindl.	+	-	+	+	+	+	+	-	Threatened
59	<i>Dendrobium numaldeori</i> C. Deori et al.	+	+	-	-	-	-	-	-	Rare
60	<i>Dendrobium ochreatum</i> Lindl.	-	-	+	+	+	+	-	-	
61	<i>Dendrobium pachyphyllum</i> (Kuntze) Bakh.f.	-	+	-	-	-	-	-	-	Rare
62	<i>Dendrobium palpebrae</i> Lindl.	+	-	-	+	-	-	+	-	Rare
63	<i>Dendrobium parciflorum</i> Rchb. f. ex Lindl.	+	-	+	-	-	-	-	-	
64	<i>Dendrobium parishii</i> H. Low	+	-	+	-	+	-	-	-	Rare
65	<i>Dendrobium peguanum</i> Lindl.	-	-	-	-	+	-	+	-	Very Rare, Endangered
66	<i>Dendrobium pendulum</i> Roxb.	+	-	+	-	+	-	-	+	Rare, Threatened, Endangered
67	<i>Dendrobium porphyrochilum</i> Lindl.	+	+	-	+	+	+	+	-	Rare, Threatened, Endangered
68	<i>Dendrobium praecinctum</i> Rchb. f.	-	-	-	-	-	-	+	-	Very Rare, Threatened, Endangered
69	<i>Dendrobium primulinum</i> Lindl.	+	-	+	+	+	-	+	-	
70	<i>Dendrobium</i>	-	-	+	-	+	+	-	-	

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		ArP	Assm	Manip	Megh	Mizo	Naga	Sikm	Trip	
71	<i>Dendrobium pycnostachyum</i> Lindl.	-	-	-	-	+	-	-	-	
72	<i>Dendrobium ruckerii</i> Lindl.	-	-	-	-	+	-	+	-	Rare, Threatened, Endangered
73	<i>Dendrobium spatella</i> Rchb.f.	+	-	-	-	-	-	-	-	Rare, Threatened
74	<i>Dendrobium stuposum</i> Lindl.	+	-	+	+	-	+	+	-	Rare, Threatened, Endangered
75	<i>Dendrobium sulcatum</i> Lindl.	+	+	+	+	+	-	+	-	Rare, Threatened, Endangered
76	<i>Dendrobium terminale</i> Par. & Reichb.f.	+	+	-	+	+	-	+	-	Rare, Threatened, Endangered
77	<i>Dendrobium thyrsoflorum</i> B.S. Williams	-	-	+	-	-	+	+	+	Rare, Threatened
78	<i>Dendrobium transparens</i> Lindl.	+	+	+	+	+	+	+	-	Threatened
79	<i>Dendrobium vexabile</i> Rchb.f.	+	-	-	-	-	-	-	-	Rare
80	<i>Dendrobium wardianum</i> Warner	+	-	+	+	-	+	-	-	Rare
81	<i>Dendrobium williamsonii</i> Day & Rchb.f.	-	+	+	+	-	+	-	-	
82	<i>Dendrobium wattii</i> (Hook. f.) Rchb. f.	-	-	+	-	-	+	-	-	Rare, Endangered

Sectional Distribution of Indian *Dendrobium* from Northeast India:

Section **Bolbidium** Lindl.
Dendrobium pachyphyllum

Section **Callista** (Lour.) Schltr.

Dendrobium lendleyi, *Dendrobium jenkinsii*, *Dendrobium sulcatum*, *Dendrobium chrysotoxum*, *Dendrobium griffithianum*, *Dendrobium densiflorum*, *Dendrobium thyrsoflorum*, *Dendrobium fameri*, *Dendrobium palpebrae*, *Dendrobium meghalayense*

Section **Dendrobium**

Dendrobium brymerianum, *Dendrobium fimbriatum*, *Dendrobium moschatum*, *Dendrobium chryseum*, *Dendrobium gibsonii*, *Dendrobium capillipes*, *Dendrobium heterocarpum*, *Dendrobium chrysanthum*, *Dendrobium ochreatum*, *Dendrobium falconeri*, *Dendrobium wardianum*, *Dendrobium gratiosissimum*, *Dendrobium pendulum*, *Dendrobium parishii*, *Dendrobium*

devonianum, *Dendrobium pulchellum*, *Dendrobium primulinum*, *Dendrobium aphyllum*, *Dendrobium cretaceum*, *Dendrobium bensonae*, *Dendrobium fimbriatum* var. *occulatum*, *Dendrobium crepidatum*, *Dendrobium lituiflorum*, *Dendrobium nobile*, *Dendrobium amoenum*, *Dendrobium arachnites*, *Dendrobium assamicum*, *Dendrobium clavatum*, *Dendrobium khasianum*, *Dendrobium ruckeri*, *Dendrobium hookerianum*, *Dendrobium transparens*, *Dendrobium jaintianum*, *Dendrobium nareshbahadurii*, *Dendrobium pulchellum*.

Section **Breviflores** Hk.f.

Dendrobium aduncum, *Dendrobium linguella*, *Dendrobium stuposum*, *Dendrobium parciflorum*, *Dendrobium bicameratum*.

Section **Formosae** (Benth. & Hook.f.) Hook.f.

Dendrobium bellatulum, *Dendrobium draconis*, *Dendrobium formosum*, *Dendrobium wattii*, *Dendrobium*

infundibulum, *Dendrobium cariniferum*, *Dendrobium williamsonii*, *Dendrobium longicornu*.

Section **Stachybum** Lindl.

Dendrobium peguanum, *Dendrobium monticola*, *Dendrobium porphyrochilum*, *Dendrobium denudans*, *Dendrobium eriiflorum*, *Dendrobium pycnostachyum*, *Dendrobium darjeelingense*, *Dendrobium miserum*.

Section **Pedilonum** (Bl.) Lindl.

Dendrobium cumulatum

Section **Rhopalanthe** Schltr.

Dendrobium podagraria

Section **Aporum** (Bl.) Lindl.

Dendrobium acinaciforme, *Dendrobium terminale*, *Dendrobium mannii*, *Dendrobium nathanielis*, *Dendrobium keithii*, *Dendrobium anceps*, *Dendrobium spatella*.

Section **Strogyle** Lindl.

Dendrobium kentrophyllum, *Dendrobium parciflorum*.

Section **Grastidium** (Bl.) J.J. Smith

Dendrobium salaccense (**D. catchartii*)

Section **Stuposa**

Dendrobium praecinctum.

II. DISCUSSION

In India, Orchidaceae is the second largest family among the angiospermic flora with 184 genera and 1229 species (Karthikeyan, 2000) and mainly distributed in the Eastern Himalayas along with the northeast region. The region is one of the major habitats of *Dendrobium* in the world and centre of species diversity. Out of 900 species (Dressler, 1993) reported in the world, 103 species are reported from India out of which 77 species are from northeast region (Singh et al., 2001). Under the present investigations 82 species are recorded from different parts of the region. These species are grouped into 12 sections viz., *Bolbidium*, *Callista*, *Dendrobium*, *Breviflores*, *Formosae*, *Stachyobium*, *Pedilonum*, *Rhopalanthe*, *Aporum*, *Strongyle*, *Gratidium* and *Stuposa* following the grouping made by Seidenfaden (1985). The section *Dendrobium* has got maximum number of species (35) while the section *Bolbidium*, *Pedilonum*, *Stuposa*, *Rhopalanthe* and *Gratidium* comprises least number of species (only 1 in each). The section *Callista*, *Formosa*, *Stachyobium*, *Aporum* includes 10, 8, 8 and 7 species respectively and the section *Breviflores* and *Strongyle* comprises 5 and 2 species respectively. The *Dendrobium* species are distributed throughout the regions with a maximum diversity found in Arunachal Pradesh with 49 species and a minimum diversity of 5 species in Tripura. However, 48 species were recorded in Manipur, 46 Assam, 42 Meghalaya, 41 Sikkim, 40 Mizoram and 30 Nagaland respectively. About 30 species have shown common distributional patterns and present almost in all the states of the region. The species like *D. anceps*, *D. aphyllum*, *D. chrysanthum*, *D. chrysotoxum*, *D. crepidatum*, *D. densiflorum*,

D. devonianum, *D. falconeri*, *D. fimbriatum*, *D. crepidatum*, *D. lindleyi*, *D. heterocarpum*, and *D. transparens* are found almost in all the states of the region. On the other hand, there are few species, which are endemic to a particular state within the region. For instance, *D. dickasonii* (**D. arachnites*), *D. bellatullum*, *D. brymerianum*, *D. clavatum*, *D. capillipes* and *D. gratiosissimum* are found only in Manipur; *D. monticola*, *D. vexabile*, *D. arunachalense*, *D. nareshbahadurii*, *D. spatella* in Arunachal Pradesh; *D. assamicum*, *D. keithii*, *D. graffithianum*, *D. darjeelingense*, *D. pachyphyllum* in Assam; *D. khasianum*, *D. jaitianum*, *D. meghalayense* in Meghalaya; *D. ruckerii* in Mizoram; *D. praecinctum* in Sikkim and *D. wattii* in Nagaland state. The details state wise distributional pattern of the *Dendrobium* species is depicted in the table 1. It is observed that majority of the species (46 spp.) are confined only in the Northeast region. There are 36 species from northeast region that are common with the rest of the country are, viz., *D. amoenum*, *D. anceps*, *D. aphyllum*, *D. bicameratum*, *D. candidum*, *D. cathcartii*, *D. chrysanthum*, *D. transparens*, *D. crepidatum*, *D. cumulatum*, *D. eriiflorum*, *D. fimbriatum*, *D. heterocarpum*, *D. barbatulum*, *D. monticola*, *D. moschatum*, *D. peguanum*, *D. sulcatum*, *D. formosum*, *D. lindleyi*, *D. aduncum*, *D. chrysotoxum*, *D. densiflorum*, *D. denudans*, *D. devonianum*, *D. falconeri*, *D. farmeri*, *D. longicornu*, *D. nobile*, *D. ochreatum*, *D. porphyrochilum*, *D. praecinctum*, *D. stuposum*, *D. terminale*, *D. chryseum*, *D. primulinum* and *D. darjeelingense*.

III. CONCLUSION

In spite of its richness in species diversity, about 71 per cent of the total species found in the region are either in a state of rare, endangered or threatened category (Table 1), which is an alarming signal. Besides these, some of the species reported by earlier workers could not be traced or located probably, due to deforestation or excess collections from their natural habitats. Therefore, urgent steps for conservation have to be taken up at different levels in order to preserve the most popular and economically important genus in the field of floral trade in Asia and other parts of the world. In the present studies some species are identify as a potential in floriculture industry viz., *D. chrysotoxum*, *D. densiflorum*, *D. falconeri*, *D. wardianum*, *D. chrysanthum*, *D. nobile*, *D. fimbriatum*, *D. infundibulum*, *D. devonianum*, *D. thyrsoflorum*, *D. hookerianum*, *D. lindleyi*, *D. ochreatum*, *D. gibsonii*, *D. lituiflorum*, *D. porphyrochilum*, *D. denudans*, *D. denneanum*, *D. aphyllum*, *D. primulinum*, *D. bensonae*, *D. farmeri*, *D. moschatum* and *D. formosum*. The *Dendrobium* species are biologically diverse and very complex group in general so more scientific research in different aspect is require for better understanding of their systematic and preservation of the Germplasm of this important group.

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