

THE GENUS *DENDROBIUM* SW. IN SOUTHERN ASSAM (BARAK VALLEY), CACHAR

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Abstract

The paper reports 16 species of *Dendrobium* Sw. from the Barak Valley (Assam), and provides information on their distribution range, tree host specificity, flowering period, and biological status in the valley.

Introduction

DENDROBIUM SW., a large group of morphologically diverse and epiphytic orchids known for their beautiful and long-lasting flowers of varied colours, comprises more than 1,000 species distributed in Sri Lanka, India, China, Japan, Malaysia, and Australia and is the second largest genus of the family Orchidaceae. In India, it is represented by 102 species, 20 of which are met in Assam (Barua, 2001). The genus is popular with both the amateur and professional growers having contributed immensely to commercial floriculture. Gogoi (2005) reported 7 floriculturally significant species of the genus from Dibru-Saikhowa National Park and Biosphere Reserve.

Barak valley, spread over the districts Cachar, Karimganj and Hailakandi in the southern Assam, is surrounded by Cachar Hills district in the north, Mizoram in south, Manipur in the east, and Tripura and Bangladesh in the west. With an altitude of 26-27 m above MSL, the valley lies between 24° 8'-25° 8' N latitude and 92° 15'-93° 15' East Longitude, and derives its name from the river Barak. It experiences excessive humidity; the rainy season extends from May to October with maximum rainfall during the months of May to August. The climate, in general, is warm and humid and it supports tropical to subtropical evergreen forests dotted with patches of bamboos and canebrakes. It is also conducive for the growth and development of epiphytic vegetation. A total of sixteen Reserve Forests are located here.

Since much is not known about the orchid diversity of Barak valley, a programme was initiated to survey and document its orchid vegetation. This paper lists the *Dendrobium* species occurring in the valley besides providing information on their flowering period, and population status.

Material and Methods

Extensive field surveys were carried out periodically in different parts of the valley particularly in the Reserve Forests, to study the distribution pattern, host preferences, and population status of different species of *Dendrobium*. Live collections in each species, made at different stages of development during 2004-2007, were maintained in the green house, Department of Ecology and Environmental Science for critical taxonomic evaluation. The taxonomic identity of different species was authenticated using standard orchid literature (Barua, 2001; Chowdhury, 2005; Hooker, 1888; Hynniewta *et al.*, 2000; Katak, 1986; King and Pantling, 1988;) and by comparing with the herbarium specimens at The Botanical Survey of India (Eastern Circle), Shillong. Voucher specimens have been deposited in the Assam University Herbarium (Department of Ecology and Environmental Science), Silchar (ASSAM).

Results

Present surveys revealed a rich diversity of *Dendrobium* species in Barak valley. Sixteen species including some with ornamental potential were collected (Figs. 1-6). The collected species are listed in Table 1, which also summarizes data on their distribution range, host preferences, flowering period, and population status in the valley. But for *D. anceps* that flowers in winter (November-February), and *D. chrysanthum* and *D. eriaeflorum* which bloom during September-October, the flowering in all the present species is a pre-monsoon phenomenon. *Albizia lebbek*, *Anthocephalus chinensis*, *Artocarpus heterophyllus*, *Bischofia javonica*, *Bombax ceiba*, *Cedrela toona*, *Ficus benghalensis*, *Lagerstromia reginae*, *Mangifera indica*, *Tamarindus indica*, and *Tectona grandis* were the most preferred phorophytes for dendrobies, here. Incidentally, the natural populations in all the present species are progressively on decline due to habitat loss resulting through

Table 1. *Dendrobium* species, their tree hosts, distribution, flowering and fruiting and population status in Barak valley

S.No	species	Host Plant*	Distribution**			Flowering and fruiting	Population status***
			Cachar	Karimganj	Hailakandi		
1.	<i>Dendrobium anceps</i> Sw.	h	+	+	+	November-February	R
2.	<i>D. aphyllum</i> (Roxb.) Fischer	a, c, e, g, h, i	+	+	+	April-May	R
3.	<i>D. chrysanthum</i> Wallich ex Lindl.	a, c, e, g, h	+	+	-	August-October	R
4.	<i>D. densiflorum</i> Wallich	b, c, h	+	+	+	April-May	En
5.	<i>D. eriaeflorum</i> Griff.	a, g, h, j, k	+	+	+	September-October	R
6.	<i>D. formosum</i> Roxb. ex Lindl.	b, c, h.	+	-	-	April-June	En
7.	<i>D. hookerianum</i> Lindl.	b, h, j	+	+	-	April-May	En
8.	<i>D. jenkinsii</i> Wallich ex Lindl.	h	+	+	+	April-May	R
9.	<i>D. lituiflorum</i> Lindl.	a	+	-	-	March-April	En
10.	<i>D. lindleyi</i> Steud.	b, c, h.	+	+	+	April-May	R
11.	<i>D. moschatum</i> (Buch.-Ham.) Sw.	a, b, e, g, h, k	+	+	+	April-June	Vul.
12.	<i>D. nobile</i> Lindl.	a, c, g, h	+	+	+	April-May	CEn
13.	<i>D. palpebrae</i> Lindl.	i.	+	-	-	April-May	R
14.	<i>D. podagraria</i> Hook. f.	c, d, j.	+	+	+	February-June	R
15.	<i>D. parishii</i> Reichb.f.	c, d	+	-	-	February-March	R
16.	<i>D. transparens</i> Wallich ex Lindl.	b, f, h, i	+	+	+	Apr.-June	En

* = a, *Albizia lebbeck*; b, *Anthocephalus chinensis*; c, *Artocarpus chama*; d, *Bischofia javanica*; e, *Bombax ceiba*; f, *Cedrela toona*; g, *Ficus benghalensis*; h, *Lagerstroemia reginae*; i, *Mangifera indica*; j, *Tamarindus indica*; k, *Tectona grandis*

** = +, Present; -, Absent

*** = CEn, Critically endangered; En, Endangered; R, Rare; Vul, Vulnerable

forest fragmentation, shifting cultivation, and unregulated forest felling.

Enumeration of species

1. *Dendrobium anceps* Sw. in Act. Vetensk. Acad. Noya. Handl. 21:246. 1800; Roxb., Fl. Ind. ed. 2, 3:478. 1832; Hook. f., Fl. Brit. Ind. 5: 724. 1890; King & Pantl. in Ann. Roy. Bot. Gard. Cal. 8: 4. t. 54. 1898; Katakai, Orch. Meghalaya 44. t. 8 (3a & 3b). 1986; Katakai et Barua in Manash Biosph. Res. 143. 1989; Barua, Orch. Fl. Kamp. Dist. Assam 154. 2001.

Flowering & Fruiting: November- February.

Distribution: India (Arunachal Pradesh, Assam, Meghalaya, Sikkim, Andaman Nicobar & Islands); Nepal, Bhutan, Bangladesh, Myanmar, and Thailand.

Barak valley (Cachar, Karimganj, Hailakandi)

Specimen Examined: Thilbhum and Loharbond Reserve Forests (Cachar), Bhattacharjee & Dutta- 19 (ASSAM).

2. *Dendrobium aphyllum* (Roxb.) C.E.C. Fischer in Gamble, Fl. Pres. Madras 3: 1416. 1928; Jain et Hajri in Bull. Bot. Surv. Ind. 17: 85. 1975; Joseph, Fl. Nongpoh & vic. 283. 1982; Katakai, Orch. Meghalaya 61. 1986; Katakai. et Barua in Manas Biosph. Res. 143. 1989; Barua, Orch. Fl. Kamp. Dist. Assam 169. Fig. 58. 2001

Flowering & Fruiting: April-May.

Distribution: India (Arunachal Pradesh, Assam, Nagaland, Meghalaya, Manipur, Mizoram, Tripura, Sikkim); Butan, Nepal, Bangladesh, Myanmar, Thailand, and China.

Barak valley (Cachar, Karimganj, Hailakandi)

Specimen Examined: - Katakhal and Loharbond Reserve Forests (Cachar), Bhattacharjee & Dutta:- 20 (ASSAM).

3. *Dendrobium chrysanthum* Lindl., Gen & Sp. Orch. 80. 1830; Hook. f., Fl. Brit. Ind. 5: 747. 1890; King & Pantl. in Ann. Roy. Bot. Gard. Cal. 8: 55. t. 77. 1898; Seidenf. & Smitnd. 2 (2): 198. t. 155 a'

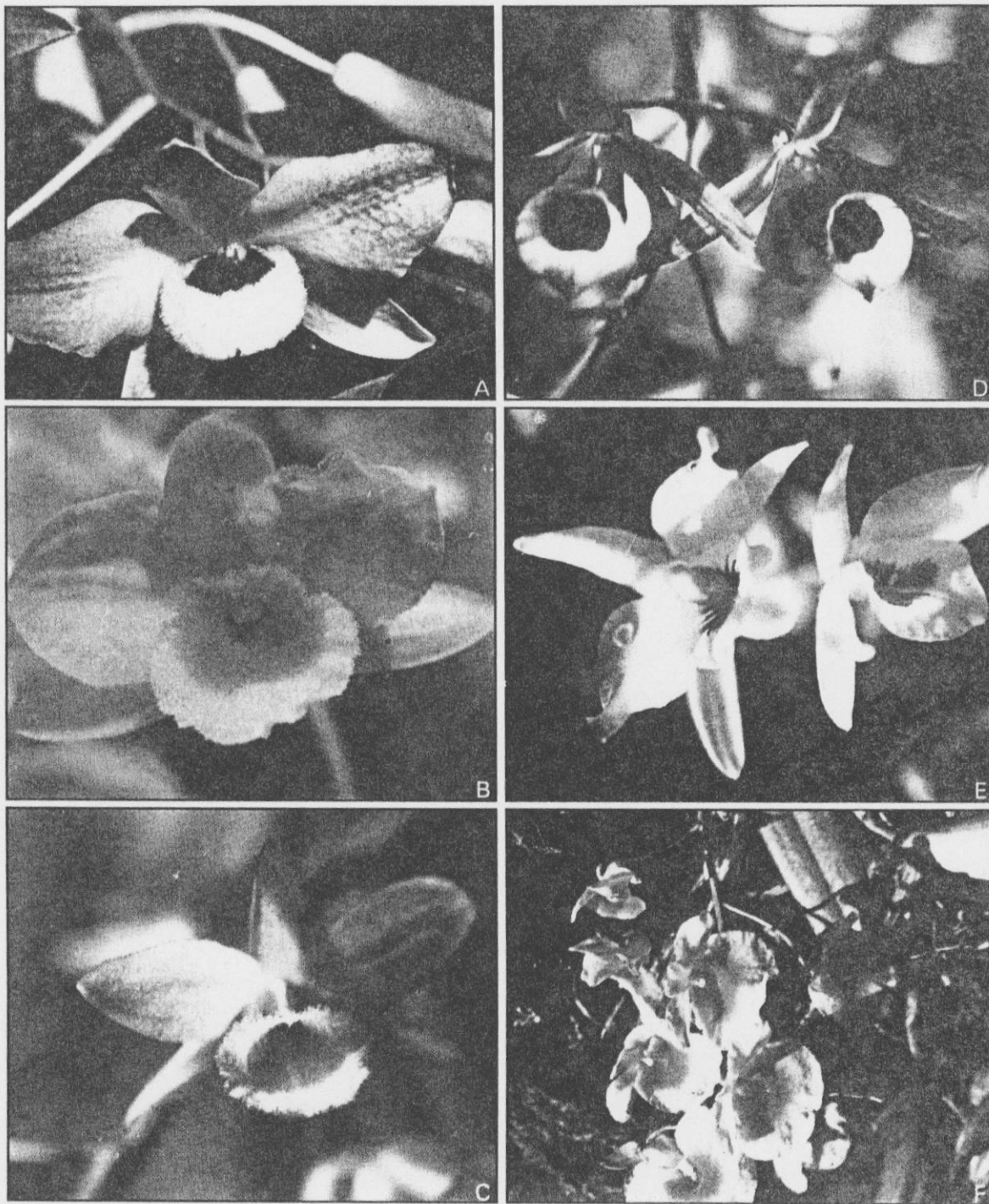


Fig.1 (A-F). Floriculturally significant species of *Dendrobium* in Barak valley: A, *D. moschatum*; B, *D. palpabrae*; C, *D. aphyllum*; D, *D. lituiflorum*; E, *D. transparens*; F, *D. lindleyi*.

&.1960; Kataki, Orch. Meghalaya 52. T. 10(5)
F(ii).1986.

Flowering & Fruiting: August-October.

Distribution: India (Arunachal Pradesh, Assam, Nagaland, Meghalaya, Manipur, Tripura, Sikkim); Butan,

Mayanmar, Cambodia, Malaya, Nepal, Thailand, and China.

Barak valley (Cachar, Karimganj)

Specimen Examined: Katakhal and Loharbond Reserve Forests (Cachar), Bhattacharjee & Dutta - 21 (ASSAM).

4. *Dendrobium densiflorum* L. in Wallich Pl. Asiat. Rar. 1: 34. t. 40. 1830; Hook.f., Fl. Brit. Ind. 5: 748. 1890; King et Pantl. in Ann. Roy. Bot. Gard. Cal. 8: 56. t. 79. 1898; Kataki, Orch. Meghalaya 48.t.10 (4) F. (iv). 1986; Barua, Orch. Fl. Kamp. Dist. Assam. 165. t. 55 & 56 2001.

Flowering & Fruiting: April-May

Distribution: India (Arunachal Pradesh, Assam, Nagaland, Meghalaya, Manipur, Mizoram, Sikkim); Butan Nepal, Myanmar, Thailand, and China.

Barak valley (Cachar, Karimganj, Hailakandi)

Specimen Examined: Katakhal, Loharbond, and Borail Reserve Forests (Cachar), Bhattacharjee & Dutta - 22 (ASSAM).

5. *Dendrobium eriaeflorum* Griff., Notul. Pl. 3: 316. 1848; Ic. Pl. Asiat. t. 307. 1851; Hook.f., Fl. Brit. Ind. 5: 715. 1890; King & Pantl. in Ann. Roy. Bot. Gard. Cal. 8: 44. t. 61. 1898; Holttum, Rev. Fl. Malaya 1: 308. 1953; Kataki, Orch. Meghalaya 47.t.9 (2a & 2b). 1986.

Flowering & Fruiting: September- October.

Distribution: India (Arunachal Pradesh, Assam, Nagaland, Meghalaya, Manipur, Sikkim); Butan Nepal, Myanmar, and Thailand.

Barak valley (Cachar, Karimganj, Hailakandi)

Specimen Examined: Loharbond, Katakhal, and Rajnikhal under Dhaloi Range of Innerline Reserve Forests (Cachar), Bhattacharjee & Dutta-23 (ASSAM)

6. *Dendrobium formosum*, Roxb. in Wallich, Pl. Asiat. Rar 1(2):34.t.29. 1830; Hook. f., Fl. Brit. Ind. 5: 721. 1890; King & Pantl. in Ann. Roy. Bot. Gard. Calcutta, 8:47. t.65. 1898; Kataki, Orch. Meghalaya 53.t.12(2), pl. g (ii). 1986; Barua, Orch. Fl. Kamp. Dist. Assam. 168. 2001.

Flowering & Fruiting: April-June.

Distribution: India (Arunachal Pradesh, Assam, Nagaland, Meghalaya, Manipur, Sikkim & Peninsular); Butan, Bangladesh, Nepal, Myanmar, Thailand, and Malaya.

Barak valley (Cachar)

Specimen Examined: Loharbond Reserve Forest (Cachar), Bhattacharjee & Dutta - 24 (ASSAM).

7. *Dendrobium hookerianum* L. in J. Linn. Soc. 3: 8. 1859; In Bot. Mag. t. 6013. 1873; Hook. f., Fl. Brit.

Ind. 5: 745. 1890; King & Pantl. in Ann. Roy. Bot. Gard. Cal. 8: 83. t. 59. 1898; Kataki, Orch. Meghalaya 50. t. 11 (5) & G (iii). 1986.

Flowering & Fruiting: April- May.

Distribution: India (Arunachal Pradesh, Assam, Nagaland, Meghalaya, Manipur, Mizoram, Sikkim); Nepal.

Barak valley (Cachar, Karimganj)

Specimen Examined: Katakhal, Loharbond, and Borail Reserve Forests (Cachar), Bhattacharjee & Dutta - 25 (ASSAM)

8. *Dendrobium jenkinsii* Wallich ex Lindl., Gen. & Sp. Orch. 89. 1831; Kataki, Orch. Meghalaya. 46. t. 9(3a & 3b) & G(iv.). pl. G(iv). 1986; Barua, Orch. Fl. Kamp. Dist. Assam 155. Fig. 50. 2001.

Flowering & Fruiting: April - May.

Distribution: India (Arunachal Pradesh, Assam, Nagaland, Meghalaya, Manipur, Mizoram, Sikkim & Peninsula); Thailand.

Barak valley (Cachar, Karimganj, Hailakandi)

Specimen Examined: Katakhal, Loharbond, and Borail Reserve Forests (Cachar), Bhattacharjee & Dutta-26 (ASSAM).

9. *Dendrobium lindleyi* Steud., Nomencl. 490. 1840; Hunt et Summer. in Kew Bull. 20 (1): 55. 1966; Kataki et Barua in Manas Biosph. Res. 143. 1983; Kataki, Orch. Meghalaya 46. 1986; Barua, Orch. Fl. Kamp. Dist. Assam 157. Fig. 51. 2001.

Flowering & Fruiting: April- May.

Distribution: India (Arunachal Pradesh, Assam, Nagaland, Meghalaya, Manipur, Mizoram, Sikkim); Bhutan, Bangladesh, Myanmar, Thailand, and China.

Barak valley (Cachar, Karimganj, Hailakandi)

Specimen Examined: Katakhal and Loharbond Reserve Forests (Cachar)

Bhattacharjee & Dutta - 27 (ASSAM)

10. *Dendrobium lituiflorum* Lindl. in Gard. Chron. 372. 1856; Hook.f., Fl. Brit. India 5: 740. 1890; Barua, Orch. Fl. Kamp. Dist. Assam 174.t. 59. 2001.

Flowering & Fruiting: March- April.

Distribution: India (Arunachal Pradesh, Assam, Nagaland, Manipur, Mizoram); Bangladesh, China, Myanmar and, Thailand.

Barak valley (Cachar)

Specimen Examined: Katakhal and Loharbond Reserve Forests (Cachar), Bhattacharjee & Dutta- 28(ASSAM).

Notes: Flowers 15-25 or sometimes more on one stem. New leafy shoots begin to appear during flowering. This species differs from another pendulous, deciduous species *D. aphyllum* in having much stouter stem and pinkish flowers. Epiphytic usually on the *Albizia* sp. on the road side tree. Extremely rare.

11. *Dendrobium moschatum* (Buch. - Ham.) Sw. in Schrader, Neu. J. Bot. 1: 943. 1805; Lindl., Gen. & Sp. Orch. 82. 1830; In Wall. Pl. Asiat. Rar. 2: 83. t. 95. 1831; King et Pantl. in Ann. Roy. Bot. Gard. Cal. 8: 60.t.84. 1898; Kataki, Orch. Meghalaya 51.t. 12 (3) & H (ii) .1986; Barua, Orch. Fl. Kamp. Dist. Assam. 159. Fig. 52. 2001.

Flowering & Fruiting: April-June.

Distribution: India (Arunachal Pradesh, Assam, Nagaland, Meghalaya, Manipur, Mizoram, Tripura, Sikkim) ; Butan, Nepal, Bangladesh, Mayanmar, and Thailand.

Barak valley (Cachar, Karimganj, Hailakandi)

Specimen Examined: Thilbhum, Katakhal, Borail, Innerline Reserve Forests, and Kumbhirgram & Pathecherra Tea estates (Karimganj & Cachar), Bhattacharjee & Dutta- 30(ASSAM).

12. *Dendrobium nobile* Lindl., Gen. & Sp. Orch. Pl. 79. 1830; Hook. f., Fl. Brit. Ind. 5: 740. 1890; King & Pantl. in Ann. Roy. Bot. Gard. Cal. 8: 51. t. 71. 1898; Holtum., 291. 1955 ; Kataki, Orch. Meghalaya 56. t. H (iii). 1986.

Flowering & Fruiting: April- May.

Distribution: India (Arunachal Pradesh, Assam, Nagaland, Meghalaya, Manipur, Mizoram, Sikkim); Butan, Nepal, Mayanmar, Thailand, and China.

Barak valley (Cachar, Karimganj, Hailakandi)

Specimen Examined: Thilbhum, Katakhal, Borail, Innerline Reserve Forest, and Kumboor & Pathecherra Tea estates (Karimganj & Cachar), Bhattacharjee & Dutta-30(ASSAM).

13. *Dendrobium palpebrae* L. in J. Hort. Soc. 5: 33. 1850; Hook. f., Fl. Brit. Ind. 5: 750. 1890.

Flowering & Fruiting: April- May.

Distribution: India (Arunachal Pradesh, Assam, Sikkim); Bangladesh, Mayanmar, Thailand and, China.

Barak valley (Cachar)

Specimen Examined: Loharbond and Katakhal Reserve Forests (Cachar), Bhattacharjee & Dutta- 31(ASSAM).

14. *Dendrobium parishii* Reichb. f. in Bot. Zeit. 21: 237. 1863; Hook. f., Fl. Brit. Ind. 5: 740. 1890.

Flowering & Fruiting: February – May.

Distribution: India (Assam, Nagaland, Manipur); Mayanmar, Thailand, Malaya, and China.

Specimen Examined: Katakhal Reserve Forest (Cachar), Barak valley (Cachar), Bhattacharjee & Dutta- 32 (ASSAM).

15. *Dendrobium podagraria* Hook. f., Fl. Brit. Ind. 5: 728. 1890.

Flowering & Fruiting: February-June.

Distribution: India (Arunachal Pradesh, Assam, Nagaland, Meghalaya, Manipur, Mizoram, Sikkim); Mayanmar, Butan, Nepal and Thailand.

Barak valley (Cachar, Karimganj, Hailakandi)

Specimen Examined: Katakhal Reserve Forest (Cachar), Bhattacharjee & Dutta-33 ;(ASSAM)

16. *Dendrobium transparens* Wallich ex Lindl. Gen. & Sp. Orch. 79. 1830; Bot. Mag. t. 4663. 1852; Hook. f., Fl. Brit. Ind. 5: 738. 1890; King & Pantl. in Ann. Roy. Bot. Gard. Cal. 8: 50. t. 70. 1898; Kataki, Orch. Meghalaya 61.t. 13 (1). 1986;

Flowering & Fruiting: April- June.

Distribution: India (Arunachal Pradesh, Assam, Nagaland, Meghalaya, Manipur, Mizoram, Sikkim & Peninsula); Butan, Nepal.

Barak valley (Cachar, Karimganj, Hailakandi)

Specimen Examined: Katakhal, Borail, Thilbhum, Innerline Reserve Forest, and Kumbha & Pathecherra Tea estates (Cachar), Bhattacharjee & Dutta-34 (ASSAM).

Discussion

Sixteen species of *Dendrobium* were presently collected from Barak valley. These include nine species (*Dendrobium. aphyllum*, *D. chrysanthum*, *D.*

densiflorum, *D. formosum*, *D. lituiflorum*, *D. moschatum*, *D. nobile*, *D. transparens*, *D. palpabrae*) that are floriculturally significant and comprise an important genetic resource. However as most of them are threatened of survival in the valley due mainly to anthropogenic pressures, their mass propagation and habitat protection are urgently required for sustainable development. In this connection, we have already initiated an awareness campaign about the scientific and economic importance of these plants; a programme for their mass propagation *in vitro* has also been started.

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References

- Barua, I. C. 2001. *Orchid Flora of Kamrup District*. Bishen Singh Mahendra Pal Singh, Dehradun, India.
- Chowdhury, S. 2005. *Assam's Flora (Present status of vascular Plants)*. Assam Science Technology of Environment Council, Guwahati, India.
- Gogoi, K. 2005. The Genus *Dendrobium* in Dibru-Saikhowa National Park and Biosphere Reserve. *J. Orchid Soc. India*, **19** (1 & 2): 17-25.
- Hooker, J. D. 1888. *Flora of British India*. Vol. 5. L. Reeve and Co., Ashford, Kent.
- Hynniewta, T. M., S. K. Kataki, and B. M. Wadhwa. 2000. *Orchids of Nagaland*, (eds. P. K. Hajra and U. Chatterjee), BSI, Calcutta, India.
- Kataki, S.K. 1986. *Orchids of Meghalaya*. Govt. of Meghalaya, Shillong, India.
- King, G. and R. Pantling. 1898. The Orchids of the Sikkim Himalaya. *Ann. Roy. Bot. Gard. Calcutta*, **8**: 1 -342. Reprint 2001. Bishen Singh Mahendra Pal Singh, Dehradun, India.