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Orchid species of Manipur and its commercial aspect

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Abstract

Manipur is well known for its diverse Biodiversity as it falls within the Indo-Burma hotspot of the world. Around 60-70% of the flora of India is found in Manipur. It covers the forest area of 23.77%, with Genera of 67 and 207 species of orchids. *Dendrobium* sp. is quit abundantly found in the state with more than 60 species. Orchids are the extremely decorative plants, its use in several ways in which for ornamental merchandise. Collection of species, growing medium, pots, cultivation techniques, and type of shade house or a poly-house is very important for plantation of orchids for the farmer and for commercial aspect. The interested farmer must train implementation for the cultivation and cut flower in Manipur. Within this survey, we tend to study regarding the orchids that abundantly found in Manipur and commercial aspect.

Key-words: Orchid, Biodiversity, *Dendrobium*, Distribution, Indo-Burma hotspot, Commercial aspects

Introduction

Orchids are the foremost diverged flowering plant families, with over 800 represented genera and 25,000–30,000 species (De and D. Singh, 2015). The distribution of orchids is worldwide, except for the Antarctic continent and some isolated islands. Columbia and Indo-Malaysian represents the world's richest areas in terms of distribution of orchids. As several as 1331 species of orchids felicity of 186 genera are recorded from India (Das, et al., 2007). Orchids are worldwide in distribution with greater concentration in tropical and subtropical regions of high humidity. In India, orchids form 9% of the flora with the Himalayas as their main habitat and others scattered in eastern and Western Ghats. In general, the terrestrial orchids are more common in North-Western India and Epiphytic in North-Eastern India. Orchids found in the Western Ghats are usually with small flowers (Chandankumar, 2009). North East India is additionally noted for its wealthy diverseness, each plant, and animals and taken into account to be one in all the Mega-biodiversity Centers within the world. In North-east India i.e. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura occupies 7% of India's total region supporting 50% of the flora (ca. 8000 species), of which 31.58% (ca. 2526 species) is endemic (De and Medhi, 2014).

The region is wealthy in varied species of orchids. Northeast India sustains the best range of orchids concerning 850 species. As several as 34 species of orchids from North-east India are listed among the vulnerable plants of India and 85 species are measure endemic to the current region.

Orchids unit differentiate into Epiphytic, Terrestrial, Saprophytic and Lithophytes plant. They are generally perennial herb indeterminate inflorescence, with sympodial stems, easy leave. Their seeds unit are very little and light-weight, and so the seeds unit disperse by the wind and growth in a new setting. The flower species listed as endangered on the International Union for Conservation of Nature (IUCN) Red List than species from the other plant family (Linthoingambi, 2015).

Manipur is one of the eight states of which falls within the North-eastern of India, is geographically placed between 23° 59' - 25° 47' N and 92° 59' - 94° 46' E. It adjoins a section of 22,327 km² and could be a part of the Indo-Myanmar diversity Hotspot (Nanda, 2013). The region supports numerous vegetation types like tropical, semitropical, temperate and alpine. In the state alone estimate around 300 orchidaceous plant species are found. Several of them are still undiscovered at the thick forest. Some rare and endemic orchidaceous plant species are *Ascozentrum ampuliaceum* (Nachom lei), *Schoenorchis manipurensis*, *Kalimpongia narjiti*. Orchidaceous plant preservation center at

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Khonghampat has around 310 different species are conserved below the wildlife forest Department, Manipur.

In term of farming, Orchids are extremely decorative plants and has high horticulture aspect. It is highly demanded in international for horticulture trade as cut flowers as well as potted plants and made up 100 % of the international contemporary cut flower trades (Chowlu and Das, 2007). Because of its distinctive pattern, form, enticing color area unit extremely demand in the international market. Most of the cut flower and decorative flower are exported from Netherland and South East Asia. The highest exporter of Orchid cut flower is from the Netherland and the highest importer is the united state of America. Production of cut flowers and flower plants has created sensible progress in Sikkim and Darjeeling. To some extent, Aunachal Pradesh has additionally created some progress in cultivating orchids, followed by Meghalaya, Mizoram, Manipur, and Nagaland (Khurajam, et al., 2017). the matters within the state are right for flower cultivation however the progress isn't satisfactory which is especially lack of awareness amongst the native folks.

Methodology

Location of study:

The study takes place at different parts of Manipur viz, Ukhrul, Churachandpur, Imphal West, etc. The Orchid Preservation Centre, Khonghampat, under the Wildlife of Forest Department, which is 12 km north of Imphal city on National Highway 39 also visit. Here the colorful flower with a sweet fragrance and wonderful views can be seen. In this Orchidarium most suitable time for visiting is in the month of April and May. This place has some interesting fact that some of the orchids have been fashioned and unique creatures like lizards, Parrots moths, and bees. In Khonghampat Orchidarium, certain rare *Cymbidium spp.* and *Cattleya spp.* are conserved. Moreover, some endangered orchid Species which are rarely found in the world like *Ascocentrum ampuliceum*, *Schoenorchis manipurensis*, *Kalimpongia narjitii* are also being conserved in this orchidarium.

Khamasom, a Village in Ukhrul Tehsil in Ukhrul District of Manipur State, India, located 18 km towards East from district head quarters Ukhrul, 24 km from Ukhrul, 81 km from State capital Imphal. This place has unique feature towards the natural vegetation locations viz. Nginu (means 'small meadow) and Ngiru (means 'big meadow in

Khamasom village local language) - within the thick forest, different orchids species are found like *Coelogyne elata*, *Calanthe brevicornu*, *Coelogyne punctulata*, endemic lily flowers and snake flower are bloom in the month of May and June, every year.

Results and Discussion

During the extensive survey in different location of Manipur, several orchids spp. were collected. From the study, we understand that the available of *Dendrobium sp.*, *Coelogyne sp.*, *Cymbidium sp.* and *Eria sp.* orchids are highest in the state.

In Manipur, the Epiphytic and Terrestrial orchids are most abundantly found whereas Saprophytes and Lithophytes are found in lesser quantity.

Commercial Aspect:

The Orchid species Like *Cymbidium*, *Dendrobium* and *Phalaenopsis* have been considered as the most Commercial market value in Europe. Being the top commercial in the international market it fetches the highest price. In Asian countries like Japan, Thailand and Singapore and the European countries like the Netherland is the major contribution of Orchids (De, Chandra, 2014). Orchids represent the first floricultural crop successfully mass propagated through Tissue Culture technique and the commercial exploitation of micro propagation techniques is being increasingly practiced in this group of great ornamentals. Half of more than 200 commercial Tissue Culture laboratories, throughout the world, micro propagate orchids and have helped in revolutionizing the orchid industry in several countries (Chandankumar, 2009).

Nowadays, in the state, cultivation of orchids is taken up by more local farmers or entrepreneur. The training for the cultivation of Orchids base Cut flower ought to incline to individuals in the state. The fashionable gardening technology supported biological sciences creating use of hardware engineering mechanisms biology and physiological needs of plants (Orchids) is required to fulfill the necessities within the quality of cut-flowers to match the market demands. Seed germination, protocorm production, in vitro propagation, production of hybrids and induction of condition, differentiation of seedlings into plantlets, hardening, transplantation to farm homes, growing them to flower as per the necessity, gather and to transport to the market, each thing at every stage biological principles are utilized in achieving perfection. Inexperienced home is the recent trend and is most desired for export production with the specified quality, amount and regularity.

In the region cultivation of Orchids requires special care, knowledge, and skills considering the hot and dry environment's condition. Collection of species, growing medium, pots, cultivation techniques, and type of shade house or poly-house is very important for plantation of orchids for the farmer and for commercial aspect. The best species that suits for the region is *Dendrobium* and *Phalaenopsis* varieties. Although it will require shade set with high humidity in between 60-80% (J.S.Khurajam. et. al. 2017). Orchids are grown regarding their need of light, humidity and tolerable temperature. Tropical orchids are most suitably grown in India. Warming growing orchids can be easily grown under shade nets. Due to attractive colored and commercially significant like *Dendrobium* varieties such as 'Sonia', 'Emma White', 'Thongchai Yellow' are best suited in Northern India climates. A single cut flower of imported *Dendrobium* 'Sonia' cost Rs. 50 in the market and the cost of one plant ranges from Rs. 500-1000 (Khurajam, Sharma, and Roy, 2017).

Orchids are an excellent item in pots, baskets, and very attractive cut flowers. The cut flower trade of the world mostly consists of 85% *Dendrobium* species and 15% *Phalaenopsis* and *Cymbidium* species and Asia is the main source of orchid (De, Lakshman Chandra, et al 2014). In Manipur, the institute like an institute of Bioresources and Sustainable Development, Takyelpat, Imphal is initiative for the mass cultivation and cut flower. Around 600 sq meters of *Dendrobium* sp. are planted.

Conclusion

From the study, we have summarized that it's rich and well known for its Biodiversity as it fall within the Biodiversity Hotspot of the world. Orchids are highly available in this area of which some are endangered and rare species. Awareness programs are also needed to attend the attraction of the public in general and entrepreneurs in particular for the benefit of mass production and trade on ornamental orchids. The main constraint for the cultivation of orchid includes difficult terrain. In Manipur, most of the area is covered by the hills and dense forest. More than that the lack of latest technology in the state leads to low cultivation of Orchids and commercial prospect. In the state having low export of orchids in the international market mainly due to inadequate research and development support, more than that the financial support needs to local farmer and entrepreneur. The farmers have less training on the post-harvest cultivation and its lead to increase the death of the plant and less the production of orchids in the market. As well as having a lack of

infrastructure of road connectivity and lack of market information, linkage and marketing centers in the region lead to low-cost production of orchids in the international markets. Skilled farmers with modern technology strategies will play an important role in increasing the production and productivity of different kinds of orchids. Deforestation practices pose a major threat to the survival of orchids, as they are greatly dependent on the environmental conditions of the forests that maintain.

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Table 1: Distribution of orchids in forest range of North-East India (Kataki et al., 1984)

State	Area	Dense Forest	Forest Cover	Orchid	
	000 km ²		In %	Genera	Species
Arunachal Pradesh	83,743	54,542	65.13	130	600
Assam	78,438	15,842	20.19	74	182
Manipur	22,327	5,309	23.77	67	207
Meghalaya	22,429	3,305	14.73	98	352
Mizoram	21,081	4,279	20.29	74	249
Nagaland	16,579	3,531	21.29	64	241
Sikkim	7,096	2,403	38.86	132	540
Tripura	10,488	1,825	17.40	37	66

Table 2: List of Orchid species reported from Manipur with their type of habitat and season of flowering. List also contains the local site name of the Orchids location and local name also mentioned.

Sl no.	Species	Habitat	Flowering period	Location
1	<i>Acampe ochracea</i> Hochr.	Epiphyte	Dec-Jan	Lokchao, Khujai Lok
2	<i>Acampe praemorsa</i> Roxb.	Epiphyte	Nov- Dec	Oklong
3	<i>Acampe rigida</i> Buch.-Ham. Ex Sm	Epiphytic	May-June	Saikul
4	<i>Acanthephippium striatum</i> Lindl.	Terrestrial	May-Sep	Senapati, Kangchup, Kotjim
5	<i>Acanthephippium sylhetense</i> Lindl.	Terrestrial	May-June	Kwatha, Chandel
6	<i>Aerides multiflora</i> Roxb (<i>shamjireimanbi</i>)	Epiphyte	May-july	Lokchao, Khonghampat, Jiribam
7	<i>Aerides odorata</i> Lour. (<i>Shamjirei achouba</i>)	Epiphyte	April-June	Thoubal, Khonghampat, Ukhrul
8	<i>Aerides rosea</i> Lodd. Ex Lindl. & Paxton (<i>Moreh samjirei</i>)	Epiphyte	May- June	Tamenglong, Ukhrul,
9	<i>Agrostophyllum callosum</i> Rchb. F.	Terrestrial/Epiphyte	June-July	Henbung, Ukhrul
10	<i>Agrostophyllum planicaule</i> Rchb. f.	Terrestrial/Epiphyte	April- May	Ukhrul, Senapati
11	<i>Anoecochilus roxburghii</i> Wall.	Terrestrial	Aug	Henbung, Tamenglong
12	<i>Anoecochilus tetra terus</i> Hooker	Terrestrial	June-Aug	Khonghampat
13	<i>Anthogonium gracile</i> Wall. Ex lindl.	Terrestrial	June-July	Henbung, Ukhrul
14	<i>Aphyllorchis montana</i> Rchb.	Terrestrial	July-Aug	Khonghampat
15	<i>Arachnis Labrosa</i> (Lindl & Paxton) Rchb.	Terrestrial	Aug-Sep	Khonghampat, Ukhrul
16	<i>Arachnis clarkei</i> Rolfe	Epiphyte	Nov-jan	Khonghampat, Senapati
17	<i>Arundina graminifolia</i> D. Don and Hochr. (<i>Kongyamba lei</i>)	Terrestrial	April- Dec	Khonghampat, Jiribam
18	<i>Ascocentrum ampullaceum</i> Roxb & Schltr (<i>nachomlei leimachu</i>)	Epiphytic	April- May	Tengnoupal, khonghampat, Henbung
19	<i>Ascocentrum micranthum</i> Lindl.	Epiphyte	May-June	Khonghampat, Churachandpur
20	<i>Bletilla striata</i> Rchb.	Terrestrial	March-April	Ukhrul, Senapati
21	<i>Brachycorythis galeandra</i> Rchb. f.	Terrestrial	July	Nongmaiching, Ukhrul
22	<i>Brachycorythis obcordata</i> Lindl.	Terrestrial	July	Nongmaiching, Ukhrul
23	<i>Bulbophyllum affine</i> Lindl.	Epiphyte	April- June	Senapati
24	<i>Bulbophyllum careyanum</i> Hk. Spreng	Epiphyte	Oct- Dec	Ukhrul, Senapati, Khonghampat
25	<i>Bulbophyllum cariniflorum</i> Rchb.f.	Epiphyte	July	Ukhrul, Khamjong
26	<i>Bulbophyllum cylindraceum</i> Wall	Epiphyte	Oct- Nov	Willong, senapati
27	<i>Bulbophyllum delitescens</i> Hance	Epiphyte	June-July	Ukhrul, Senapati, Khongampat.
28	<i>Bulbophyllum dickasonii</i> Seidenf	Epiphyte	January-March	Chakpikarong, Chandel
29	<i>Bulbophyllum dissitiflorum</i> Seidenf	Epiphyte	December-January	Lokchao, Chandel
30	<i>Bulbophyllum elatum</i> (Hook.f.) J.J.Sm	Epiphyte	May-August	Thoubal
31	<i>Bulbophyllum elassonotum</i> Summerh	Epiphyte	May-August	Senapati, Ukhrul, Khongampat
31	<i>Bulbophyllum forrestii</i> Seidenf	Epiphyte	July-August	Oklong, Senapati
32	<i>Bulbophyllum gamblei</i> (Hook. F.)	Epiphyte	June-August	Yangoupokpi Lokchao Wildlife Sanctuary, Lai Lok, Senapati, Hengbung
33	<i>Bulbophyllum guttulatum</i> (Hook. f.)	Epiphyte	July- Sept.	Tamenglong district, Tipaimukh

34	<i>Bulbophyllum gymnopus</i> Hook.f.	Epiphyte	November-December	Senapati, Tamenglong, Ukhrul, Khongampat
35	<i>Bulbophyllum helenae</i> Kuntze	Epiphyte	July-August	Sadim, Senapati district
36	<i>Bulbophyllum hirtum</i> (Sm) Lindl.	Epiphyte	November-December	Hengbung, Senapati district
37	<i>Bulbophyllum khasyanum</i> Griff.	Epiphyte	November-December	Senapati, Ukhrul, Khongampat
38	<i>Bulbophyllum leopardinum</i> (Wall)	Epiphyte	July-August	Senapati, Ukhrul, Khongampat
39	<i>Calanthe biloba</i> Lindl.	Terrestrial	Oct- Nov	Senapati, Ukhrul
40	<i>Calanthe brevicornu</i> Lindl.	Terrestrial	March-April	Kouburu, Ukhrul, Khongampat
41	<i>Calanthe Mannii</i> Hook. f.	Terrestrial	April-May	Khamasom, Senapati
42	<i>Calanthe masuca</i> Hook. f.	Terrestrial	Aug-Sept	Khongampat, Ukhrul, Senapati
43	<i>Calanthe triplicata</i> Ames.	Terrestrial	May-July	Ukhrul, Chandel
44	<i>Coelogyne barbata</i> Lindl.	Epiphytic	Sept-Nov	Willong, ukhrul,
45	<i>Coelogyne corymbosa</i> Lindl.	Epiphytic	Mar-April	Ukhrul
46	<i>Coelogyne cristata</i> Lindl.	Epiphytic	May-July	Ukhrul, Khongampat
47	<i>Coelogyne fimbriata</i> Lindl.	Epiphytic	Sep-Oct	Khangkhui, Senapati
48	<i>Coelogyne flaccida</i> Lindl.	Epiphytic	Mar-April	Tamenglong, Ukhrul
49	<i>Coelogyne fuscescens</i> Lindl.	Epiphytic	Oct-Dec	Bishnupur, Churachanpur
50	<i>Coelogyne longipes</i> Lindl.	Epiphytic	May-June	Ukhrul, Senapati
51	<i>Coelogyne nitida</i> Lindley.	Epiphytic	April-May	Khasom Khullen, Mao, Khongampat
52	<i>Coelogyne ovalis</i> Lindl.	Epiphytic	Oct-Dec	Ukhrul, Mao, khongampat
53	<i>Coelogyne prolifera</i> Lindley.	Epiphytic	June-July	Henbung, Khongampat, Ukhrul
54	<i>Coelogyne trinervis</i> Lindl.	Epiphytic/Lit hophytic	Oct- Nov	Khongampat, Ukhrul
55	<i>Cymbidium aloifolium</i> Sw.	Epiphytic	April-May	Kangpokpi, Henbung, Moreh
56	<i>Cymbidium bicolor</i> Lindl.	Epiphytic	April-May	Henbung hill
57	<i>Cymbidium cypripedium</i> Wall.	Epiphytic/Sa prophytic	Nov	Tamenglong
58	<i>Cymbidium eburneum</i> Lindley	Epiphytic	April-May	Tamenglong
59	<i>Cymbidium elegans</i> Lindley.	Epiphytic	March-April	Jiribam, Ukhrul
60	<i>Cymbidium iridioides</i> D. Don.		Sep-nov	Ukhrul
61	<i>Cymbidium lancifolium</i> Hook	Terrestrial	June-July	Henbung, Khongampat
62	<i>Cymbidium lowianum</i> Rchb. f.	Epiphytic	Nov-Feb	Thoubal, Bishnupur
63	<i>Cymbidium munronianum</i> King & Pantl.	Terrestrial	May-June	Tamengong
64	<i>Dendrobium aduncum</i> Wall. ex Lindl.	Epiphytic	June-July	Jiribam, Ukhrul
65	<i>Dendrobium aphyllum</i> Roxb (Lyon leimacha).	Epiphytic	April-May	Yangoupokpi
66	<i>Dendrobium bellatulum</i> Rolfe	Epiphytic	April-May	Mao, Tengenoupal, Senapati

67	<i>Dendrobium bensoniae</i> Rchb.f.	Epiphytic	June-July	Tengnoupal, Senapati
68	<i>Dendrobium bicameratum</i> Lindl	Epiphytic	June-july	Senapati
69	<i>Dendrobium capillipes</i> Rchb.f.	Epiphytic	April-May	Churachandpur
70	<i>Dendrobium carineferum</i> Rchb.f.	Epiphytic	May-June	Shiroi, Henbung
71	<i>Dendrobium cysanthum</i> Wall & Lindl. (Mera leikham)	Epiphytic	October	Senapati
72	<i>Dendrobium cysotoxum</i> Lindl (khongamelei).	Epiphytic	April-May	Yangoupokpi, ukhrul
73	<i>Dendrobium crepidatum</i> Lindl. & Paxton.	Epiphytic	April-May	Khonghampat
74	<i>Dendrobium crystallinum</i> Rchb.f.	Epiphytic	April-June	Khonghampat, Ukhrul
75	<i>Dendrobium dantaniense</i> Guillaumin.	Epiphytic	June-Aug	Senapati, Ukhrul
76	<i>Dendrobium delacouri</i> Guillaumin.	Epiphytic	May-June	Yangoupokpi, Ukhrul
77	<i>Dendrobium densifolium</i>	Epiphytic	April-June	Senapati
78	<i>Dendrobium densiflorum</i> Lindl. (Meileisna)	Epiphytic	April-May	Senapati
79	<i>Dendrobium devonianum</i> Paxton	Epiphytic	May-June	Khonghampat
80	<i>Dendrobium draconis</i> Rchb.f.	Epiphytic	May-June	Ukhrul, Khonghampat
81	<i>Dendrobium falconerii</i> Hook.f (Tingthou lei).	Epiphytic	April-May	Senapati,
82	<i>Dendrobium farmer</i> Paxton	Epiphytic	April-May	Yangoupokpi, Ukhrul
83	<i>Dendrobium fimbriatum</i> Hook.	Epiphytic	March-April	Tengnoupal, chandel, Khonghampat
84	<i>Dendrobium formosum</i> Roxb.	Epiphytic	April-May	Churachandpur
85	<i>Dendrobium gibsonii</i> Paxton	Epiphytic	June-July	Leimakhong
86	<i>Dendrobium heterocarpum</i> Wall.	Epiphytic	April-May	Senapati, Ukhrul
87	<i>Dendrobium hookerianum</i> Lindl.	Epiphytic	Sept-Oct	Khonghampat
88	<i>Dendrobium infundibulum</i> Lindl. (iyonglei angouna)	Epiphytic	March-May	Yangoupokpi, Senapati
89	<i>Dendrobium jenkinsii</i> Wall (Thengu lei).	Epiphytic	March-April	Yangoupokpi, ukhrul
90	<i>Dendrobium lituiflorum</i> Lindl (Shahi lei).	Epiphytic	March-April	Thoubal, Ukhrul
91	<i>Dendrobium longicornu</i> Lindley.	Epiphytic	Sep-Nov	Senapati, Ukhrul
92	<i>Dendrobium manii</i> Ridl.	Epiphytic	March-may	Khujai lok
93	<i>Dendrobium moschatum</i> Wall.(Enga lei)	Epiphytic	May-June	Khujai lok
94	<i>Dendrobium nobile</i> Lindley. Yerum lei)	Epiphytic	April-may	Senapati, ukhrul
95	<i>Dendrobium ocheatum</i> Lindl.	Epiphytic	April-May	Lokchao, Ukhrul
96	<i>Dendrobium parishii</i> Rchb.f. (Shempak lei)	Epiphytic	May-june	Senapati, Ukhrul

97	<i>Dendrobium pendulum</i> Roxb.	Epiphytic	May-June	Lokchao, Khonghampat
98	<i>Dendrobium spatella</i> Rchb.f.	Epiphytic	Oct-Nov	Senapati, Sangaitel
99	<i>Dendrobium stuposum</i> Lindl.	Epiphytic	June-July	Senapati
100	<i>Dendrobium wardianum</i> Warner.	Epiphytic	April-may	Willong
101	<i>Eria acervata</i> Lindl.	Epiphytic	May-June	Tupul, Ukhrul
102	<i>Eria amica</i> Rchb.f.	Epiphytic	March-May	Henbung, Ukhrul, Senapati
103	<i>Eria bambusifolia</i> Lindley.	Epiphytic	December	Tengnoupal, Henbung
104	<i>Eria biflora</i> Griff.	Epiphytic	Nov	Yangoupokpi, Senapati
105	<i>Eria coronaria</i> Lindl.	Epiphytic	Nov	Henbung, Khangkhui
106	<i>Eria pannea</i> Lindl.	Epiphytic	April-Sept	Yangoupokpi, Senapati
107	<i>Eria spicata</i> D. Don.	Epiphytic	July-Aug	Tamenglong
108	<i>Eria vittata</i> Lindl.	Epiphytic	March-June	Thoubal, Senapati
109	<i>Eulophia zollingeri</i> Rchb.f.	Terrestrial	May-July	Henbung, Khonghampat
110	<i>Galeola lindleyana</i> Hook.	Terrestrial	June-July	Khonghampat, Ukhrul
111	<i>Gastrochilus acutifolius</i> Lindl.	Terrestrial	Oct-Nov	Khudengthabi, Khonghampat
112	<i>Gastrochilus bellinus</i> Rchb.f.	Terrestrial	April	Willong, Ukhrul
113	<i>Gastrochilus cacealaris</i> D. Don.	Terrestrial	March-May	Kasom, Khuleen Lamakhong
114	<i>Gastrochilus obliquus</i> Lindl.	Terrestrial	Oct-Dec	Khonghampat, Yaingangpokpi
115	<i>Geodorum densifolium</i> Schltr.	Terrestrial	June-July	Shiroi, Tamenglong
116	<i>Geodorum recuvum</i> Roxb.	Terrestrial	April-May	Kakching, Tengnoupal
117	<i>Goodyera procera</i> Hook.	Terrestrial	Feb-March	Henbung, Khonghampat
118	<i>Habenaria acutifera</i> Wall. ex Lindl.	Terrestrial	July-Aug	Henbung, Ukhrul
119	<i>Liparis bistrata</i> E. C. Parish & Rchb. f.	Terrestrial	June- July	Tamenglong, ukhrul
120	<i>Liparis bootanensis</i> Griff.	Terrestrial	Sep-Nov	Oklong, Khonghampat
121	<i>Liparis elliptica</i> Wight.	Epiphytic	Nov-Dec	Henbung, Ukhrul
122	<i>Liparis plantaginea</i> lindl.	Epiphyte	Jun-sept	Khonghampat, Ukhrul
123	<i>Luisia antennifera</i> .Blume.	Epiphyte	March- June	Khonghampat, Ukhrul
124	<i>Lusia jonesii</i> .J.J. Sm	Epiphyte	May-June	Moreh
125	<i>Malaxis acuminata</i> .D. Don.	Terrestrial	Aug- sept	Khonghampat, Tamenglong
126	<i>Neogyna gardneriana</i> (Lindl) Rchb.f.	Lithophytes	Oct-Nov.	Henbung, Hill, Kupra
127	<i>Oberonia ensiformis</i> (Sm.)Lindl.	Epiphyte	Oct-Nov.	Willong Khunou
128	<i>Otochilus fuscus</i> .Lindl & wall.	Terrestrial	March-April	Oklong, Phedinga
129	<i>Paphiopedilum hirsutissimum</i> lindl. Ex Hook.	Terrestrial	Oct-Nov.	Moreh, Willong, Khunou, Khundangthabi.
130	<i>Paphipedilum insigne</i> Wall Ex Lindl.	Terrestrial	Oct-Dec.	Khonghampat, Tamenglong

131	<i>Paphipedilum spicerianum</i> Rchb.f.	Terrestrial	Sept-Oct.	Nungba
132	<i>Phaius flavus</i> . (Blume) Lindl	Terrestrial	April-June	Lamlang
133	<i>Phaius mishmensis</i> lindl.&Paxton . Rchb.	Terrestrial	Oct-Nov.	Tamu
134	<i>Phaius tankervilleae</i> . Blume	Terrestrial	March-May	Hengbung, Ukhrul
135	<i>Phaius wallichii</i> Lindl.	Terrestrial	May-June	Imphal East
136	<i>Phalaenopsis parishii</i> Rchb.f.	Epiphyte	March-April	Yangoupokpi Lokchao
137	<i>Pholidota articulate</i> Lindl.	Epiphyte	April-May	Senapati, Thoubal
138	<i>Pholidota imbricate</i> Lindl.	Epiphyte	June-July	Koirengei, Oklong, Yangoupokpi
139	<i>Pleione humilis</i> . (Sm.) D	Epiphyte	March-April	Hengbung Hill
140	<i>Pleione marculata</i> lindl& Paxton	Epiphyte	Oct-Nov.	Ningba, Hengbung Hill
141	<i>Pleione praecox</i> . D.Don.	Epiphyte	Sept-Oct.	Willong
142	<i>Renanthera imschootiana</i> Rolfe.	Epiphytic	April-May	Henbung, Moreh, Bonjang, Yangoupokpi
143	<i>Rhynchostylis resuta</i> Blume.	Epiphytic	April	Tamenglong, Imphal, Henbung, Thoubal
144	<i>Schoenorchis gemma</i> Lindl.	Epiphytic	May-June	Tamenglong, Yangoupokpi Lokchao,
145	<i>Schoenorchis fragrans</i> (Parish & Rchb)	Epiphytic	May-June	Khonghampat,
146	<i>Spathoglottis pubescens</i> Lindley.	Terrestrial	Sept	Ukhrul
147	<i>Tainia angustifolia</i> Lindl.	Terrestrial	July-Aug	Henbung, Senapati, Khonghampat
148	<i>Tainia latifolia</i> Lindl.	Terrestrial	Mar-April	Koirengei
149	<i>Thelasis longifolia</i> Hook.f.	Epiphytic	July-Aug	Khonghampat,
150	<i>Thunia alba</i> Lindley & Rchb.f.	Epi/Litho	May-June	Henbung, Ukhrul, Yangoupokpi, Kwatha
151	<i>Thunia marshalliana</i> Rchb.f. (U-takhellei)	Epi/Litho	May-June	Khonghampat
152	<i>Uncifera acuminata</i> Lindl.	Epiphytic	April-May	Oklong, Senapati, Khonghampat
153	<i>Vanda alpine</i> Lindl.	Epiphytic	July-Aug	Khonghampat
154	<i>Vanda coerulea</i> Griff. Ex. Lindl. (blue vanda, Kwaklei)	Epiphytic	Sept-Oct	Yangoupokpi, Chandel
155	<i>Vanda coerulea</i> f. Luwangalba. (kwaklei angouba)	Epiphytic	Sept-Nov	Khonhampat, Thoubal, Imphal, Moreh
156	<i>Vanda coerulescens</i> Griff. (Kwakibi)	Epiphytic	March-April	Khonghampat, Ukhrul, Senapati
157	<i>Vanda cristata</i> Lindley.	Epiphytic	June-July	Kangpokpi, Khonghampat, Senapati
158	<i>Vanda parviflora</i> Lindley. (Kwakibi hangampal)	Epiphytic	Apr-May	Khonghampat, Imphal
159	<i>Vanda bicolor</i> Griff.	Epiphytic	March-June	Yangoupokpi, Chandel

160	<i>Vanda teres Roxb. & Schltr. (cheiteklei)</i>	Epiphytic	May-June	Khonghampat, Tamenglong,
161	<i>Vandopsis parishii Schltr. (kwaklei nathabi)</i>	Epiphytic	Apr-May	Khonghampat, Thoubal
162	<i>Vandopsis undulata Lindl.</i>	Epiphytic	May-June	Khonghampat

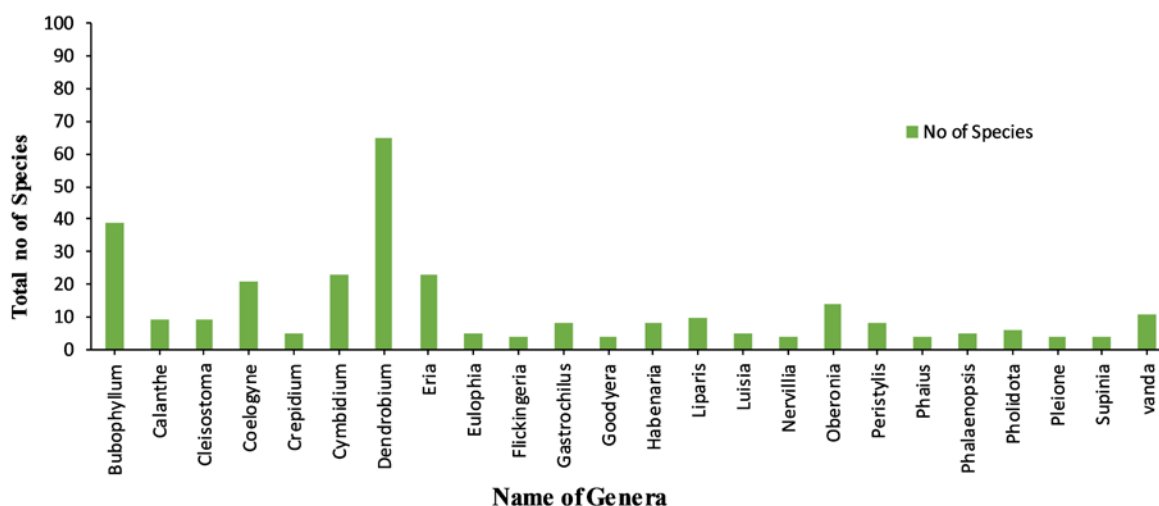


Fig. 1: Orchid genera with a total number of species so far reported from Manipur. Dendrobium genus is most abundant with the highest number of species in this region

Distribution of Orchid's habitat in Manipur

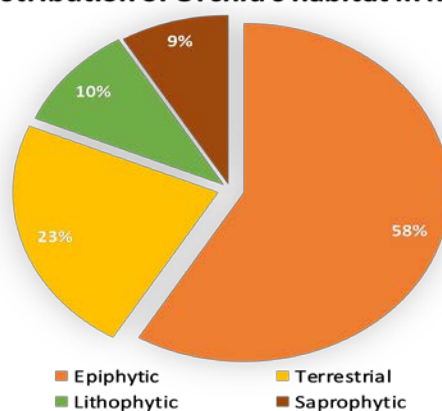


Fig. 2: Pie chart showing the habitat distribution pattern of Orchid in Manipur. The pattern is like Epi phyte>Terrestrial>Saprophyte>Lithophyte.



Fig. 3: Pictorial presentation of some important orchid species found in Manipur.



1. *Dendrobium gratiosissimum* Rchb. f.



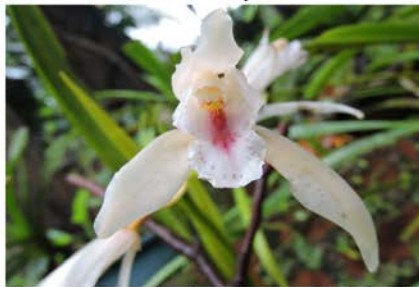
2. *Dendrobium chrysotoxum* Lindl.



3. *Bulbophyllum odoratissimum* (Sm.) Lindl ex Wall.



4. *Dendrobium thyrsiflorum* B.S. Williams



5. *Cymbidium roseum* J.J.Sm



6. *Paphiopedilum insigne* Lindl.



7. *Phaius mishmensis* (Lindl. & Paxton) Rchb.f.



8. *Coelogyne nitida* (Wall. ex D.Don) Lindl.



9. *Eria bambusifolia* Lindl.



10. *Cymbidium lancifolium* Hook.



11. *Neogyna gardneriana* Rchb. f.



12. *Calante brevicornu* Lindl.

Fig. 4: Pictorial presentation of some important orchid species found in Manipur.



Fig. 5: Pictorial presentation of some important orchid species found in Manipur.

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