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A study on the host plant of orchids in the reserved forest of Sadu Chiru & Laimaton Hill of Imphal Valley Manipur

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Abstract
Orchidaceae family are herbaceous plant and are mostly epiphytic although some are also found as terrestrial, saprophytes and lithophytes. They are the second largest flowering plant in the angiosperm family. The present paper deal with the orchids associated with their host plants in the Reserved Forest of Sadu Chiru and Laimaton Hill of Imphal Valley, Manipur. It was observed that 28 orchid species belonging to 11 genus were found to be epiphytic to 18 plants species. The most common host plant supporting large number of orchid species is found to be Schima wallichii (DC.)Korth (DC.) Korth, Mangifera indica L., Lagerstroemia speciosa Pers. and Terminalia tomentosa Wight & Arn.

Keywords: orchidaceae, epiphytic, Sadu Chiru and Laimaton Hill, host plants

Introduction

Orchidaceae family is considered to be species diversity flowering plants distributed throughout the world of all angiosperm families comprising about 25,000 - 35,000 species belonging to 800- 100 genera, accounting for almost 30% of monocotyledons having diverse habits with various modified vegetative and floral structure (Dressler, 1993 [1]; Nikishina *et al*., 2001a [2]; Cribb *et al*.,2003 [3]; Chase 2005 [4]; Lucksom,2007 [5]; Hossain 2011 [6]; Chase *et al*.,2015 [7]; Christenhusz and Byng, 2016) [8] and only next to Asteraceae family (The Plant List 2014). Orchids are charismatic ornamental flower among all the plants and are at risk of extinction and highly endangered for over-exploitation, over-collection, deforestation and breakdown in their ecological connections (IUCN/SSC Orchid Specialist Group 1996 [9]; Mondragon & Elliot, 2013 [10]; Koopowitz & Dixon 2003 [11]; Nurfadilah 2015) [12]

About 70% of orchids are epiphytic, comprising approximately two-third of the world's epiphytic flora (Gravendeel *et al*., 2004 [13]), 25% terrestrial and the leftover 5% are found on various support. Epiphytic orchids are more adaptable and their positioning chiefly depends on moisture availability, light intensity and positioning of the host trees. It also depends upon the character of the host plants like the age of the host, positioning of the host and the type, size, texture and age of the bark.

In India, orchids belonging to 186 genera with 1331 species have been reported, from these 34 orchids species are listed as threatened and 85 species endemic from Northeast India (Gurung and Gurung 2016) [14]. Northeast India constitutes eight states namely Manipur, Assam, Nagaland, Sikkim, Meghalaya, Tripura, Meghalaya and Arunachal Pradesh. It was conclude to occupied about 50% of the total flora found in India in which 31.58% is endemic to Northeast only (De and Medhi,2014) [15]. Manipur in the Northeast India falls under the Indo-Burma Biodiversity hotspot and is endowed with rich diverse floral and faunal species.

The climate of Manipur is largely influenced by the topography of the hilly region which defines the geography of Manipur and one of the diverse floras which has been present in abundantly is the Orchidaceae family.

The present paper deal with the orchids associated with their host plants in the Reserved Forest of Sadu Chiru and Laimaton Hill of Imphal Valley, Manipur.

Materials and Methods

This study was conducted on the Resevered Forest of Sadu Chiru and Laimaton Hills located between $24^0$37'28.83" N and $93^0$41'33.85" E with the elevation of 1,782m above sea level. The survey was conducted during the tenure of June 2019 to December 2020 for the distribution of orchids and their associated host plants. The orchids were identified with the help of Flora of Manipur, Orchids of India, Manuals of Orchids. Identification of host plant is done by considering the morphological characters and reproductive features of the plant specimens.

Result and Discussion

From the survey conducted during June 2019 – December 2020, it was observed that 28 orchid species belonging to 11 genus were found to be epiphytic to 18 plants species. The most common host plant supporting large number of orchid species is found to be *Schima wallichii* (DC.) Korth with 8 orchid species, *Lagerstroemia speciosa* Pers. With 7 orchid species and *Terminalia tomentosa* with 5 orchid species (Fig 1). The present study also showed that the most abundant orchid genus belongs to *Dendrobium* with 11 species.

Table 1: Orchids with their associated host plants.

Sl. No	Orchids	Host Plant
1	*Acampe papillosa* Lindley	*Schima wallichi* (DC.)Korth, *Lagerstroemia speciosa* Pers.
2	*Aerides fieldingii* Lodd ex E. Morren	*Mangifera indica* L., *Terminalia tomentosa* Wight & Arn
3	*Aerides odoratum* Lour	*Schima wallichii* (DC.)Korth, *Cedrella tooma* M.Roem
4	*Ascocentrum ampullaceum* (Roxb.) Schltr.	*Dalbergia sisoo* Roxb., *Syzygium cumini* (L.)Skeels
5	*Bulbophyllum affine* Lindley	*Terminalia tomentosa* Wight & Arn, *Michelia champaca* L., *Lagerstroemia speciosa* Pers.
6	*Bulbophyllum grifithii* Rchb.f.	*Artocarpus chaplasa* Roxb., *Albizia lebbek* (L.) Benth
7	*Coelogyne graminifolia* C.S.P. Parish & Rchb.f	*Schima wallichii* (DC.)Korth, *Terminalia myriocarpa* Van Heurck & Müll.Arg.
8	*Cymbidium bicolour* Lindley	*Artocarpus chaplasa* Roxb., *Schima wallichii* (DC.)Korth
9	*Cymbidium giganteum* Sw.	*Lagerstroemia speciosa* Pers., *Gmelina arborea*, Roxb.
10	*Dendrobium aphyllum* Roxb. Syn *D. pierardii* Roxb. Ex Hook.	*Quercus serreta* Roxb., *Terminalia tomentosa* Wight & Arn, *Michelia champaca* L.
11	*Dendrobium chrysanthum* Wall	*Bauhainia purpurea* L., *Lagerstroemia speciosa* Pers.
12	*Dendrobium chrysotoxum* Lindley	*Cedrella tooma* M.Roem *Schima wallichii* (DC.)Korth
13	*Dendrobium falconeri* Hook.	*Albizia lebbek* (L.)Benth, *Schima wallichii* (DC.)Korth
14	*Dendrobium fimbriatum* Lindley	*Lagerstroemia speciosa* Pers., *Quercus serreta* Roxb.
15	*Dendrobium lituiflorum* Lindley	*Bauhainia variegate* L. *Dalbergia sisoo* Roxb. *Syzygium cumini* (L.) Skeels
16	*Dendrobium nobile* Lindley	*Cedrella tooma, Terminalia tomentosa* Wight & Arn
17	*Dendrobium ochreatum* Lindley	*Mangifera indica* L. *Schima wallichii (DC.)Korth*
18	*Dendrobium primulinum* Lindley	*Artocarpus heterophyllus* Lam. *Mangifera indica* L.
19	*Dendrobium transparens* Wall.	*Michelia champaca* L. *Phoebe hainesiana* Brandis
20	*Dendrobium wardianum* R. Warner	*Dalbergia sisoo* Roxb. *Lagerstroemia speciosa* Pers.
21	*Pholidota articulata* Lindley	Syzygium cumini (L.) Skeels *Terminalia tomentosa* Wight & Arn
22	*Pholidota imbricata* Lindley	*Bauhiania purpurea* L. *Cedrella tooma* M.Roem
23	*Renanthera imschootiana* Rolfe	*Mangifera indica* L. Schima wallichii (DC.)Korth
24	*Rhynchostylis retusa* Blume	*Artocarpus chaplasa* Roxb. *Phoebe hainesiana* Brandis
25	*Vanda coerulea* Griff. ex Lindley	*Terminalia myriocarpa* Van Heurck & Müll.
26	*Vanda coerulescens* Lindley	*Bauhinia acuminate* L. *Phoebe hainesiana* Brandis
27	*Vanda cristata* Lindley	*Gmelia arborea* Roxb. *Lagerstroemia speciosa* Pers.
28	*Vanda parviflora* Lindley	*Albizia lebbek* (L.) Benth *Schima wallichii* (DC.) Korth

Conclusion

The present study shows that bark roughness of the host plant and the area of the substrate was the most important host characteristic that influence the abundance of orchids. Moreover deforestation and unplanned human activities also lead to depletion of orchids in nature as well as rise of extinction of orchids that are associated with the host plants. It is necessary to conduct awareness programme on protection and conservation of orchids and their associated host plant among the students and local community residing near the forest to protect them in their environmental condition.

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