

Conservation of Orchids in Imphal Valley, Manipur

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Abstract: Orchids are herbaceous plants found mostly as epiphytic, terrestrial and saprophytic, belonging to the family Orchidaceae constituting the second largest family in flowering plants under the order Asparagles. They are cosmopolitan throughout the world with an about 10,000 genera, and 25,000-35,000 species. They are in high demand due to their extraordinary flowers which exhibit an incredible range of diversity in shape, size and the colour of their flowers. In India, Orchids are represented by 1129 species and 184 genera and show maximum diversity in the eastern Himalaya, including the North Eastern region, Western Ghats, Eastern Himalaya & Eastern part of Western Himalaya. Northeast India comprises of 8 states with 876 orchids species in 152 genera constituting nearly 70% of total orchid flora in India. Manipur is one of the state in Northeastern-India with its capital in Imphal and geographically it comes under the Southeast Asia region. The climate of Manipur is largely influenced by the topography of the hilly region which defines the geography of Manipur. Manipur had diverse flora and fauna and one of the diverse flora which had been present abundantly is the Orchidaceae i.e the orchid family. Around 280 orchid species had been reported from Manipur. Manipur constitute of two parts as 1) the Manipur Central Plain or Imphal Valley and 2) The Barak basin or Barak valley. Although Imphal valley is consider to be plain, it is scattered by occasional hills and monadnocks above the general level of valley. However with the expansion of human habitation and their activities in the habitat of this rare plant has rendered shrinkage of the nature distribution zone of this plant group. The present paper will be dealing with the conservation undertaken by the people and the government of Manipur in Orchid Conservation and what can be included for better conservation of these beautiful plants from extinct in nature due to mankind destruction under the Imphal valley, Manipur.

Keywords: Orchidaceae, cosmopolitan, Northeast, Manipur, Imphal valley, conservation.

1. INTRODUCTION

Orchids are the second largest group of flowering plants comprising about 788 genera and 18,500 species [1]. They are

distributed throughout the world, except the hot desert and Antarctica.

Due to their range of diversity in shape, size and colour of flowers and comprised of herbaceous plants, characterized by distinct floral morphology, pollination mechanism, association with unique fungal partners (mycorrhizae) and miniscule seeds they are consider to be the highly advanced family in monocots.

Orchids are classified into saprophytic, terrestrial, epiphytic and lithophytic. They are usually perennial herb racemose inflorescence, with sympodial stems, simple leaves [2,3]. Their seeds are very small and light, and with the help of wind they dispersed and if fall into some new environmental condition, they either die or try to bring some genotypic change to adapt to the new environment. The orchid species listed as threatened on the International Union for Conservation of Nature (IUCN) Red List than species from any other plant family [4].

In India, they are represented by 186 genera and 1,141 species [5]. North East region of India is also considered as one of the mega biodiversity spot in terms of richness of flora and fauna diversity. In this region it is estimated about 876 orchid species in 151 genera are available.

Manipur is one of the states in North-eastern-India with its capital in Imphal and geographically it comes under the Southeast Asia region. The state has been extended in between 23054/ N to 250 41/ N latitudes and 930 02/ E to 940 47/ E longitudes with a total geographical area of 22,327 sq km. The Manipur valley occupies 2,238 sq km constituting about 10% of the total area of the state. It constitute of two parts as 1) the Manipur Central Plain or Imphal Valley and 2) The Barak basin or Barak valley. Imphal valley encompasses four districts namely Imphal East, Imphal West, Bishenpur and Thoubal. Imphal East also included a part of 171 sq km of

Jiribam falls under the Barak valley bordering by the Cachar District of Assam. Although Imphal valley is considered to be plain, it is scattered by occasional hills and monadnocks above the general level of valley. 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 had been present abundantly is the orchidaceae i.e., the orchid family. About 280 orchid species have been reported from this state. Nongmaijing Range and Jirimukh Range were selected for survey work in Imphal East whereas Langol range for Imphal West, Sadu Chiru Hills & Laimaton Hills for Bishenpur and Gwarok Hills for Thoubal were surveyed. However with the expansion of human habitation and their activities in the habitat of this rare plant has rendered shrinkage of the nature distribution zone of this plant group. In the present study in situ conservation as well as ex situ conservation sites i.e., Khongamphat Orchidarium will be incorporated so as a conservation steps.

2. STUDY SITE

Various survey works were carried in the hills of Manipur valley particularly in the selected study sites viz., Langol, Nongmaijing, Thangjing Hills, Khongamphat Orchidarium and other hills that are found in the four districts from Sept. 2011- March 2013. The study was carried out by following the Chase's method of Orchidaceae classification [6]. The study sites i.e. the Imphal valley comprises of four districts namely Imphal East, Imphal West, Thoubal and Bishnupur District. This valley covers an area of about 2067 km², which constituting nearly 9.2 % of the total geographical area of the state. Even though they are valley districts, forests are available within these four districts. In these places, natural vegetation of epiphytic and terrestrial orchids is available. Orchids like *Vanda coerulea*, *Dendrobium* spp., *Rananchera imschootiana* etc are some of the examples. However with the expansion of human habitation and their activities in the habitat of this rare plant has rendered shrinkage of the nature distribution zone of this plant group.

3. CONSERVATION STRATEGY

Conservation of orchids is now a matter of universal concern. There is an urgent need to maintain orchid sanctuaries and special efforts must be made to protect the orchids in the 'Sacred forests' of the region. As Orchids prefer to grow in undisturbed forests area either in tree trunks i.e. epiphytes, or on the forest floor i.e. terrestrial or semi terrestrial, a large number of orchid species, which were once abundant in the forests, are now at the verge of extinction. Some of them have become so rare that it has become impossible to trace them in their natural habitat.

Although being one of the most advanced groups of plants among angiosperms, orchids are highly susceptible to even slight changes in the environmental conditions. As orchids

seeds are very small and light, they are dispersed by wind. If they fall into some new environment condition, they either die or try to tolerate or even bring about some genotypic change to adapt to the new environment. This is one of the reasons why orchids are such a big group and the number of new species is always increasing, and simultaneously many orchid species are becoming extinct day by day. The habitat destruction which is occurring at an alarming rate due to deforestation and other unplanned human activities has led to a considerable depletion of orchids in nature.

Orchids are associated with the traditional culture, religion, myth, food and folk medicines of the local people of north eastern region from the ancient time. As a result the people of North eastern region conserve orchids with great care [7,8,9].

The people of Northeast East region conserve orchids in their natural habitats in sacred groves or shrine forests or in the form of village forest reserves based on their religious belief [10]. Sacred grooves or shrine forests are the forest patches rich in biodiversity and represent a long tradition of environmental conservation by the tribal communities of northeastern India. A range of traditions and cultural values of the local people helps in protective the groves/ forests with the beliefs in nature worship inherited from their ancestor, generation to generation.

The rich orchid diversity in this region have provided a great advantage to the people for observing and scrutinizing the orchid flora from generations to generation for developing their own knowledge for conservation of valuable orchid diversity in their natural habitats. According to Aarif & Mir, 2013, Manipur have about 365 documented sacred grooves.

Unfortunately the orchid diversity in Imphal Valley, Manipur is being threatened for various reasons such as the increased biotic influences, socio-economic development and uncontrolled commercial exploitation of forest wealth. Almost all the epiphytes, because of their habitat destruction pressure, and all of them figure prominently in the list of endangered plants. Although the decline in population of orchids have been attributed to ruthless commercial exploitation, by the Convention on International Trade in Endangered Species (CITES) of wild flora and fauna, it is observed that habitat destruction is the major factor involved [11].

In Manipur, dedicating a patch of forest land to deities is a common practice of the Meitei community, which assumes great significance in the conservation of natural diversity. According to their beliefs the sacred groves are the property of gods and not to allow anyone to damage the groves which helps to conserve orchids in their natural habitat [12].

So for the conservation of orchid, Government of Manipur preserved the orchid in The Orchid Preservation Centre, Khonghampat, under the Wildlife Wing of Forest Department,

12 km north of Imphal city on National Highway 39, is said to be preserving about 300 species of orchids including the rare and endangered species. The orchids are collected from all over the hills of Manipur and preserved in this Orchidarium as an ex-situ conservation. Most of the orchids are preserved here are epiphytes and terrestrial but some lithophytes, saprophytic and climbers are also present.

The uncontrolled orchid export trade and illegal smuggling are major problems to conserve orchids in their natural habitats. So preservation of orchids as an ex-situ conservation taken up by the Government of Manipur is an important task as many orchids are in the verge of extinction due to widespread deforestation, indiscreet collection and reckless smuggling.

Some of the orchids that are preserved in Orchid Preservation Centre, Khonghampat are *Bulbophyllum* spp., *Coelogynae* spp., *Cymbidium* spp., *Dendrobium* spp., *Eria* spp., *Liparis* spp., *Phaius* spp., *Renanthera imschootiana*, *Rhynchostylis retusa*, etc., and among the highly threatened species of orchids specified in Schedule-VI of the Wildlife (Protection) Act, 1972, three species namely, Blue vanda (*Vanda Coerulea*) (Kwaklei), Red vanda (*Renanthera imschootiana*) (Kwaklei Angangba) and Lady's Slipper (*Paphiopedilum* spp.) (Khongup Lei and three endemic orchid species to Manipur, viz. *Ascocentrum ampullaceum* var. *auranticum* (Nachom Lei), *Schoenorchis manipurensis* and *Kalimpongia narjitii* are preserved in Khonghampat Orchidarium Centre. The Centre is planning to collect and preserve more indigenous orchid species and developed new hybrids by crossing with the superior species, among others.

Nowadays in Colleges there is Botanical garden to provide protective custody for threatened species as well as technological and horticultural capabilities for restoring species and Biotech hub giving education on biotechnological approaches in conserving biodiversity as the modern tools of biotechnology can be utilized for propagation and conservation of plant genetic resources. These could be accomplished both by in situ and ex situ methods. The biotechnological techniques were initially introduced for the plant species having agricultural and horticultural importance, but are now rapidly being applied to the collection, propagation, preservation and evolution of rare and endangered plant germplasm.

The mass propagation of orchids through asymbiotic seed germination is a tool for the conservation of the declining orchid population in nature. The orchids seeds are minute in nature and are very difficult to germinate because they do not possess endosperm and the embryo is immature. Because of their particular fungal requirement less than 5% of the orchid seeds germinate in nature. During the last few years, tissue culture techniques using seed and appropriate explants have been developed for large scale propagation of orchids.

4. CONCLUSION

Orchid conservation is now a matter of global issue. Protection of valuable orchid species in their natural habitats is a urgent need as orchids are very sensitive to the ecological disturbances. Illegal trade of orchid species from the region should be totally checked. Conservation of orchid can be done by giving awareness programme to community groups and students and by developing more sacred grooves to conserve orchid as an in-situ way. Government should established more conservation centre for orchid as an ex-situ conservation. Training on orchid culture can be provided to the local youth as well as upliftment of the economical status to the local people.

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