



An insight into the diversity, traditional uses and conservation status of orchids in Hengbung, Senapati District, Manipur, India

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ABSTRACT

Manipur is well known for its biodiversity in flora and fauna coupled with rich tradition and culture. It has the distinction of representing a wide range of climate from sub-tropical to temperate and consequently has a wide range of biodiversity, more specifically the Orchidaceae family. About 300 species belonging to 69 genera of the family Orchidaceae have been reported from this state. The present studies have been conducted at Hengbung, Manipur to assess the orchid diversity, nativity, endemism and documentation of their socio-economic values to build up the appropriate plan for their conservation. A total of 40 species belonging to 24 genera has been identified and has been categorized into different threat status as per the IUCN list where 2 species were identified as critically endangered, 20 species as endangered, 12 species as vulnerable and 6 species as near threatened. Out of these, nineteen (19) species have been found to be used in treating common ailments like nose bleeding, gum bleeding, cold and cough, astonic, treating fractured and dislocated bones, as anti-dote for snake bite, etc. Unfortunately, the orchid diversity in the Hengbung region is being threatened for various reasons, so it is the need of the hour to come up with sustainable measures for the conservation of these important orchid species.

1. Introduction

The family "Orchidaceae" represents one of the largest flowering plant families with over 800 genera and nearly 24,500 species spread worldwide (Dressler, 2006). India is known to have a rich orchid heritage and harbors about 1350 species belonging to 186 genera which accounts for 5.98% of the world orchid flora and 6.83% of the flowering plants in the country (De and Singh, 2015). North East India comprising of 8 states viz. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura are considered as an important biodiversity hotspot for flora and fauna in the Indian subcontinent. High humidity and low temperature coupled with a good amount of rainfall

make the entire North Eastern region, an orchid hotspot. The NE region is home to about 870 orchid species distributed over 159 genera which constitute nearly 72.8% of the total orchid flora of our country. The state of Arunachal Pradesh houses a maximum orchid species of 622, followed by Sikkim (543), Meghalaya (389), Assam (290), Nagaland (246), Mizoram (234), Manipur (215), and Tripura (57) (Hazra and De, 2010). The entire region is home to more than 1/5th of the orchid species which is unique in their plant growth characteristics (De and Medhi, 2014). The use of orchids as a part of the traditions, culture, religion, food, and as an herbal medicine has come a long way since the ancient times. This has provided the ethnic communities an

advantage in knowing and observing the orchid flora leading to their conservation naturally as a part of preserving their tradition (Ramakrishnan, 1992; Arora, 1996; Dutta and Dutta, 2005; Linthoingambi *et al.* 2014). Orchids are not only a thing of exquisite beauty used for ornamental purposes but also highly valued as medicinal plants in the traditional health system owing to the presence of alkaloids, flavonoids, phenanthrenes, terpenoids, glycosides and other phytochemical properties (Rosa, 2010). The backbulbs, pseudobulbs and rhizomes of some orchid species like *Pholidota articulata*, *Habenaria acuminata*, *Orchis latifolia* and *Cymbidium* species are also consumed as food by the ethnic communities (Yonzone *et al.* 2015). Further, these wild orchids also serve as genetic resources for use in crop improvement programs. Species like *Coelogyne fuscescens*, *Ascocentrum ampullaceum*, *Paphiopedilum villosum*, *Papilionanthe teres*, *Phaius tankervillea*, *Phalaenopsis mannii*, *Pleione hookeriana*, *Renanthera imschootiana*, *Spathoglottis plicata*, *Vanda coerulea*, *Cymbidium tigrinum*, *Dendrobium densiflorum*, *Dendrobium farmeri*, *Dendrobium nobile*, etc. are reported to have high breeding value (Bose, 1980; Kumar and Sheela, 2007; De and Medhi, 2014).

The state of Manipur is one of the biodiversity hotspots that falls under the Indo-Burma region. The state covers a geographical area of 22,327 sq. km. located in between 23.83° and 25.68° North latitudes and 93.03° and 94.78° East longitudes. The climatic condition of Manipur is diverse ranging from temperate alpine to tropical and comprises of hills and valleys which makes it a storehouse of a number of endangered and endemic floral and faunal species. Amongst these are the exquisite flowering orchids which have an ethno-botanical significance related with their culture, folklore medicine, and traditional beliefs and as food. For instance, flowers of *Vanda coerulea* are used by the Manipuri women for adorning their hairs during festive occasions, while, *Liparis* flowers are used as an ornament in the legs or as an armband or in decorating their war weapons (Medhi and Chakrabarti, 2008; Yonzone *et al.* 2015). It is also home to highly threatened species of orchids which is specified in the schedule-VI of the Wildlife (Protection) Act, 1972 namely, blue vanda (*Vanda coerulea*) (Kwaklei), red vanda (*Renanthera imschootiana*) (Kwaklei Angangba) and lady's slipper (*Paphiopedilum spp.*) (Khongup Lei). Other important species which are endemic to Manipur, namely *Ascocentrum ampullaceum* var. *auranticum* (Nachom Lei), *Schoenorchis manipurensis* and *Kalimpong ianarjitii* are at present being conserved at the Khongamphat Orchidarium (Singh, 1999; De and Methi, 2014; Linthoingambi *et al.* 2014).

At present, the orchid diversity of Manipur is being threatened for various reasons such as the unscrupulous and commercial collection from the forest, conversion of forest land for socio-economic development, jhum cultivation coupled with environmental pollution, global warming, and commercialization of agriculture and forestry. Although the declines in the 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. The state is yet to be fully explored for its floristic diversity. In general, a lot of work has been carried out in the State on flora, ethno-botany, and very few studies on ecological aspects. The present paper is an attempt to study the diversity and conservation status of orchids in Hengbung, Senapati District of Manipur with the objective to analyze their nativity, endemism, rarity, identify their socio-economic values, and to build up the appropriate plan for their conservation. It is also pertinent to initiate focused studies on the conservation status of the orchids which will provide baseline information for developing management plans for the conservation.

2. Material and Methods

2.1 Study area

The present studies have been conducted in Hengbung, P.O. Kangpokpi, Senapati District, Manipur which is located at 25°13' North latitudes and 94°08' East longitude (Fig.1). The region falls under the sub-tropical to the temperate zone and has an altitude ranging from 800-2800 m. The forests in the region support a large number of sensitive biodiversity elements *viz.* medicinal, aromatic, orchids, rare and endangered, native, endemic plants and provide congenial habitats for growth and its development most of which are shade, moisture, and humus loving. The region experiences a severely cold winter and a well distributed annual rainfall of 2300mm with maximum spells of rain in summer and rainy seasons. The region is a home to a number of ethnic communities like Poumai, Mao, Maram, Thangaland, Zeliangrong and Naga tribes. There exist minorities of Tangkhum and Maring, Nagas, Kukis, Nepali, and others. The inhabitants of the region largely depend on the natural resources for their sustenance.



Fig.1. Map of the study area

2.2 Data collection

The present study is conducted to study the orchid diversity of the Hengbung region, Senapati District in Manipur during the year 2016-18 using a standard ethnobotanical approach (Sheng, 2001). Extensive field surveys, interviews, questionnaire were carried out to document ethnomedicinal uses with the local inhabitants and available resources (Jain, 1985; Samant *et al.* 2007). The rapid sampling of the species was carried out and samples of each species were brought to the herbarium of Orchid Research Development Centre (ORDC), FEEDS-KVK Sylvan, Hengbung for identification with the help of primary and secondary sources and voucher numbers were given to each specimen (Deva and Naithani, 1986; Dhaliwal and Sharma, 1999; Aswal and Malhrotra, 1994; Singh and Rawat, 2000). Nativity of the species was determined from the first record or its origin from the Indo Himalayan Region (IHR) and other published resources (Samant *et al.* 1998a; Samant *et al.* 1998b; Samant, 2002; Samant, 2009). The Endemic status of the species is recorded based on its occurrence in a particular bio-geographical location along with the help of related literature (Dhar and Samant, 1993; Samant, 2002; Samant, 2009). The species restricted to Indo Himalayan Region were identified as endemic whereas species extending their distribution to neighboring countries such as Nepal, Bhutan, Tibet, Pakistan, and Afghanistan were identified as near endemic (Samant, 2002). The status of a particular species is assessed based on its habitat preference, population size, distribution range, and use values and Habitats of

orchids were identified on the basis of the physical features through relevant literature (Samant *et al.* 1996; Ved *et al.* 2003; Ved *et al.* 2005; Rana and Samant, 2010).

3. Results

3.1 Species diversity

A total of 40 species of orchids belonging to 24 genera were recorded (Table 1). Amongst the genera, the maximum diversity was recorded in *Dendrobium* with 9 species followed by *Liparis* (3), *Cymbidium* (2), *Habenaria* (2), *Malaxis* (2), *Oberonia* (2), *Peristylus* (2), and *Crepidium* (2). The other species recorded with only one genus includes *Anthogonium gracile*, *Ascocentrum ampullaceum*, *Bulbophyllum rufinum*, *Calanthe sylvatica*, *Holcoglossum amesianum*, *Hygrochilus parishii*, *Ione kipgenii*, *Kingidium braceanum*, *Luisia filiformis*, *Pholidota pallida*, *Sunipia scariosa*, *Taeniophyllum glandulosum*, *Tainia angustifolia*, *Thunia alba*, *Vanda bicolor* and *Zeuxine affinis*.

3.2 Nativity and Endemism

Based on the analysis for the nativity of the orchids, eighteen (18) species *viz.* *Anthogonium gracile*, *Dendrobium chrysanthum*, *Dendrobium densiflorum*, *Dendrobium fimbriatum*, *Dendrobium heterocarpum*, *Dendrobium nobile*, *Dendrobium ochreatum*, *Dendrobium primulinum*, *Dendrobium wardianum*, *Habenaria intermedia*, *Ione kipgenii*, *Kingidium braceanum*, *Oberonia acaulis*, *Peristylus sussanae*, *Pholidota pallida*, *Sunipia scariosa*,

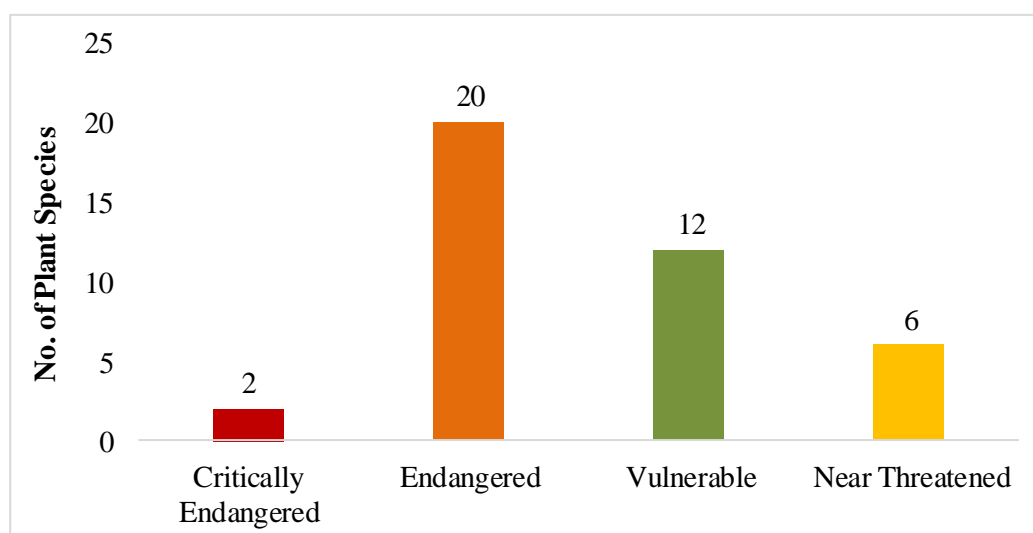
Thunia alba and *Vanda bicolor* were found to be native to the Himalayan region. Only three species were endemic to the Indian Himalayan Region namely, *Habenaria intermedia*, *Ione kipgenii*, and *Oberonia acaulis*. The other species which were identified were non-natives of the studied area.

3.3 Threat categorization

According to IUCN threat categorization, two (2) species were identified as critically endangered namely *Habenaria dentata* and *Ione kipgenii*; twenty (20) species as endangered namely *Anthogonium gracile*, *Ascocentrum ampullaceum*, *Bulbophyllum rufinum*, *Crepidium purpureum*, *Cymbidium tigrinum*, *Dendrobium densiflorum*, *Dendrobium fimbriatum*, *Dendrobium heterocarpum*, *Dendrobium nobile*, *Dendrobium ochreatum*, *Dendrobium wardianum*, *Habenaria intermedia*, *Hygrochilus parishii*, *Liparis elliptica*, *Liparis viridiflora*, *Oberonia maxima*, *Peristylus lacertiferus*, *Taeniophyllum glandulosum*, *Tainia angustifolia* and *Vanda bicolor*; twelve (12) species as vulnerable namely *Calanthe sylvatica*, *Crepidium calophyllum*, *Dendrobium crepidatum*, *Dendrobium primulinum*, *Holcoglossum amesianum*, *Kingidium braceanum*, *Liparis caespitosa*, *Luisia filiformis*, *Malaxis calophylla*, *Malaxis ophrydis*, *Sunipia scariosa*, *Thunia alba* and six (6) species as near threatened namely *Cymbidium iridioides*, *Dendrobium chrysanthum*, *Oberonia acaulis* var. *latipetala*, *Peristylus sussanae*, *Pholidota pallida* and *Zeuxine affinis* (Fig. 2.) from amongst the collected species of orchids (Table.1).

3.4 Indigenous uses

The old-age tradition and practice of healing through locally available herbs is still prevalent amongst the various ethnic communities. The use of orchids in traditional and folklore medicines to cure common ailments is well known. In the present studies, a total of nineteen (19) ethno-medicinally important species have been recorded which are used frequently or sometimes occasionally for curing various major and minor diseases occurring among local people (Table 2). They believe in the efficacy of these herbs along with its power to cure, but the knowledge is restricted to very few elderly folks only. Maximum number of plants are used to treat bone fracture or dislocation problems and as a tonic and includes species like *Anthogonium gracile*, *Ascocentrum ampullaceum*, *Bulbophyllum rufinum*, *Dendrobium chrysanthum*, *D. crepidatum*, *D. fimbriatum*, *D. heterocarpum*, *D. nobile*, *Liparis viridifolia*, *Malaxis ophrydis* and *Thunia alba*. For treating the commonly encountered cold and cough problems, *Calanthe sylvatica*, *Habenaria dentata*, *H. intermedia* and *Liparis viridifolia* are used. Species of *Dendrobium* like *D. nobile*, *D. densiflorum*, *D. fimbriatum* are used for increasing the production of body fluids. Five species of orchid viz. *Cymbidium tigrinum*, *Dendrobium chrysanthum*, *D. nobile*, *Habenaria intermedia* and *Liparis viridifolia* are used as a remedy for patients suffering from fever, while *Bulbophyllum rufinum* and *Habenaria intermedia* are administered for asthma patients. For relieving the pain or as pain killers, *Anthogonium gracile* and *Pholidota pallida* are used. *Habenaria dentata* is an important species used as an



anti-dote against snake bite. Amongst the orchid species collected, *Dendrobium nobile* is well known for its medicinal properties and has versatile use which is being used for treating multiple health problems like increasing the body fluid, as a tonic, fever, menstrual pain, tongue dryness, night sweating, tuberculosis and for wound healing. Besides these, the other species of orchids also have been found to be effective in treatment of nose bleeding, leprosy, crack heels, gum bleeding, against dyspepsia, aphrodisiac and poisoning. It has also been observed that maximum plant species are being used for the treatment of more than one kind of ailment. Proper selections of species, parts, as well as preparation and administration methods were given importance in traditional health care systems. Most of the preparations included only one plant species and in few cases mixture of different plant species was used. The majority of formulations were prepared either as juice paste and powdered form. There was no standardized dosage for the herbal remedies and most were administered through approximation.

4. Discussion

The present study provides comprehensive information on 40 species of orchids commonly found growing in the Hengbung region of Senapati district, Manipur. The orchid diversity in North East India, in general, has been studied and documented by several workers to a great extent; however, there is very little information on its phyto geography and ecology of these orchids of Indian Himalayan region (Samant *et al.* 1996; Samant, 2002; Jalal *et al.* 2009; Jalal *et al.* 2010a; Jalal *et al.* 2010b). The diversity of Orchidaceae found in Manipur has been reported by several workers (Kumar and Kumar, 2005; Yumkham *et al.* 2013; Kishor *et al.* 2014; Rao, 2015; Chowlu, 2016; Rao *et al.* 2016; Kumar, 2017). The latest updated reports indicate the presence of 389 taxa of orchids including the recently discovered 7 new species that belong to over 90 genera (Rao & Kumar, 2018). The analysis of the orchid species for their nativity and endemism has also revealed the high conservation values in the Hengbung region. It recorded the presence of 18 native and 3 endemic species that are distributed over different micro-habitats with specific ecological requirements. Over 1/5th of the orchids found in India are endemic to North East region alone which are unique and not found elsewhere in the world (De and Medhi, 2010). Threat analysis studies also have revealed two species of critically endangered orchids, twenty endangered, twelve vulnerable, and five near threatened. The orchids are highly valued plants owing to their unique characteristics as an ornamental plant and having high medicinal value. As a

result, they are being unscrupulously collected from the wild, sold in the local markets, and being exploited by the traders with most of the species have been extinct or critically endangered or assuming different threat status. This is also driven by various anthropogenic factors, changes in land use patterns leading to the destruction of the natural populations and its habitat (Swarts and Dixon, 2009). Orchids are facing higher levels of threats to their survival and are at the front-line of extinction with more species under threat globally than any other plant family (Kull *et al.* 2006). The widespread deforestation has led to the shrinkage of orchid populations and if it goes on continuing with same pace, many of the species may vanish even before their existence and biological importance will be established (Pradhan, 1975). It was also demonstrated that destruction, modification and fragmentation of natural forests hasten the local extinction process in orchids along with their heavy illegal extraction from the wild. Orchid conservation is now a matter of global issue. Further, the orchid in nature assumes a very slow growth and requires complex nutrition with a poor germination rate that makes their population and existence even more vulnerable (Salazar, 1996). In the entire north eastern region and Manipur in particular, sacred groves play a major role in harboring and conserving the biodiversity of flora and fauna at the same time. In the belief of the ethnic Meitei community of Manipur, sacred groves, or locally known as 'U-Manglai' are considered to be the abode of gods and are left undisturbed and in such places, orchids are being grown and conserved naturally. Further, rare, endangered, threatened and endemic species are often concentrated in sacred groves. The sacredness, religious beliefs, and taboos play a significant role in promoting sustainable utilization and conservation of orchid flora in the region. Many efforts have also been taken by the state government in rehabilitating these orchids like setting up of The Orchid Preservation Centre, Khonghampat, under the Wildlife Wing of Forest Department, Centre for orchid gene conservation of the eastern Himalayan region at Hengbung, Senapati District, botanical gardens, etc. (Linthoingambi *et al.* 2014).

The ethnobotanical case studies of nineteen (19) orchid species in the Hengbung region revealed interesting findings with regards to the customary use of orchids as medicine which indicates a high level of consensus within the ethnic communities of the region. The use of orchids as medicine for healing various ailments is known to the tribal communities and the knowledge has been passed on from one generation to another. They are also known to be rich in alkaloids, flavonoids, glycosides, carbohydrates, and other phytochemical contents (Samant 2002). The practice is still prevalent amongst the communities despite the advances made in the field of medicines. It reflects the rich traditional

knowledge and practices that have been preserved for several generations. The ethnobotanical uses of orchids in traditional healing practices by various tribes in Manipur have also been reported in Kom tribe (Khatoon *et al.* 2012a), Tangkhul tribe (Salazar, 1996), Kabui tribe (Devi *et al.* 2011), Chiru tribe (Rajkumari *et al.* 2012), Mao tribe (Lokho, 2012) and Muslim communities (Ahmed and Singh, 2007).

The mesmerizing orchid flowers exhibit an inconceivable range of diversity of size, shape, structure and fragrance valued as an ornamental plant, and as medicine. The protection of valuable orchid species in their natural habitats is an urgent need as orchids are very sensitive to the ecological disturbances. Illegal trade of orchid species from the region should be strictly checked to prevent them from getting endangered. The ultimate goal of conservation should

be to support sustainable development by protecting and using biological resources in ways that do not destroy important habitats and ecosystems of these uniquely flowered orchids. The renewed interest in growing and maintaining these orchids and the prevalent practice of still using them as a source of medicine at the present time echoes the need that exists to document and conserve this valuable resource.

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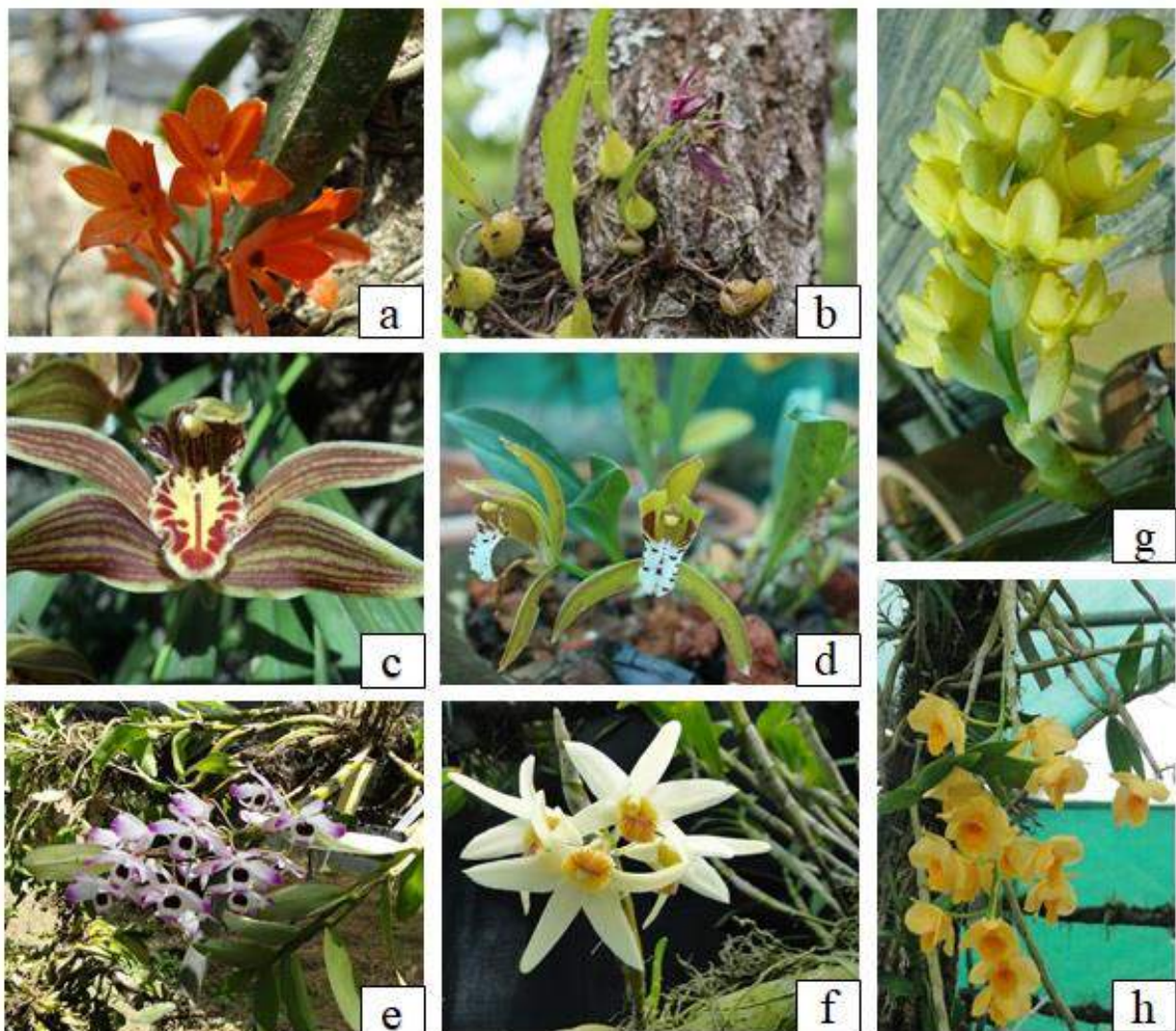


Fig.3. Orchid species from study area:(a) *Ascocentrum ampullaceum*, (b) *Ione kipgenii*, (c) *Cymbidium iridioides*, (d) *Cymbidium tigrinum*, (e) *Dendrobium nobile*, (f) *Dendrobium heterocarpum*, (g) *Dendrobium densiflorum*, (h) *Dendrobium fimbriatum*

Table.1 Diversity and status of Orchids in Hengbung, Manipur

S.No.	Taxa (Voucher No.)	Nativity	Status
1.	<i>Anthogonium gracile</i> Wall. ex Lindl. (00053)	Himalayan region	E
2.	<i>Ascocentrum ampullaceum</i> Roxb. and Schltr. (00237)	SE Asia, Malaysia	E
3.	<i>Bulbophyllum rufinum</i> Rchb. f. (00014)	Burma	E
4.	<i>Calanthe sylvatica</i> (Thouars) Lindl. (00419)	Madagascar	V
5.	<i>Crepidium calophyllum</i> (Rchb. f.) Szlach. (00311)	Malaya	V
6.	<i>Crepidium purpureum</i> (Lindl.) Szlach. (00613)	Zeylan	E
7.	<i>Cymbidium iridioides</i> D. Don (00223)	Nepal	NT
8.	<i>Cymbidium tigrinum</i> Par. ex Hook. (00101)	Burma	E
9.	<i>Dendrobium chrysanthum</i> Wall. ex Lindl. (00062)	Himalayan region	NT
10.	<i>Dendrobium crepidatum</i> Lindl. and Paxt. (00089)	India	V
11.	<i>Dendrobium densiflorum</i> Lindl. (00311)	Himalayan region	E
12.	<i>Dendrobium fimbriatum</i> Hook. (00284)	Himalayan region	E
13.	<i>Dendrobium heterocarpum</i> Wall. (00305)	Himalayan region	E
14.	<i>Dendrobium nobile</i> Lindl. (Yerum lei) (00207)	Himalayan region, China	E
15.	<i>Dendrobium ochreatum</i> Lindl. (00182)	Himalayan region, China	E
16.	<i>Dendrobium primulinum</i> Lindl. (00336)	Himalayan region	V
17.	<i>Dendrobium wardianum</i> Warner (00254)	Himalayan region	E
18.	<i>Habenaria dentata</i> (Sw.) Schltr. (00134)	China	CR
19.	<i>Habenaria intermedia</i> D. Don (00213)	Himalayan region	E
20.	<i>Holcoglossum amesianum</i> (Rchb. f.) Christ. (00078)	Cambodia	V
21.	<i>Hygrochilus parishii</i> (Veitch and Rchb. f.) Pfitzer (00540)	Burma	E
22.	<i>Ione kipgenii</i> (Kishor, Chowlu and Vij) (00144)	Himalayan region, Manipur	CR
23.	<i>Kingidium braceanum</i> (Hook. f.) Seidenf. (00382)	Himalayan region	V
24.	<i>Liparis caespitosa</i> (Lam.) Lindl. (00537)	Insular Madagascar	V
25.	<i>Liparis elliptica</i> Wight (00087)	Himalaya, Japan	E
26.	<i>Liparis viridiflora</i> Lindl. (00567)	India, Oriental, Malaya	E
27.	<i>Luisia filiformis</i> Hook. f. (00048)	Sylhet	V
28.	<i>Malaxis calophylla</i> (Rchb. f.) Kuntze (00051)	Thailand	V

29.	<i>Malaxis ophrydis</i> (J. Koenig) Ormerod(00422)	India	V
30.	<i>Oberonia acaulis</i> var. <i>latipetala</i> (00374)	Himalayan region	NT
31.	<i>Oberonia maxima</i> Parish ex Hook. f. (00484)	Tennessee	E
32.	<i>Peristylus lacertiferus</i> (Lindl.) J.J. Sm. (00109)	India, Oriental, China	E
33.	<i>Peristylus sussanae</i> (L.) Rafinesque (00721)	Himalayan region, China, Malaya	NT
34.	<i>Pholidota pallida</i> Lindl. (00544)	Himalayan region, China	NT
35.	<i>Sunipia scariosa</i> Lindl. (00349)	Himalayan region, Burma	V
36.	<i>Taeniophyllum glandulosum</i> Bl. (00346)	Java	E
37.	<i>Tainia angustifolia</i> (Lindl.) Benth. and Hook. f. (00286)	Burma	E
38.	<i>Thunia alba</i> Lindley and Rchb.f (00184)	Himalayan region	V
39.	<i>Vanda bicolor</i> Griff. (00242)	Himalayan region	E
40.	<i>Zeuxine affinis</i> (Lindl.) Benth. ex Hook. f. (00316)	India	NT

(E- Endangered; NT- Near Threatened; V-Vulnerable; CR- Critically Endangered)

Table. 2 Indigenous uses of orchids in Hengbung, Manipur

S.No.	Taxa	Part used	Uses
1.	<i>Anthogonium gracile</i> Wall. ex Lindl.	Tuber	Tuber paste is applied on the affected part to reduce the pain and also help in healing the fractured and dislocated bones.
2.	<i>Ascocentrum ampullaceum</i> Roxb. and Schltr.	Tuber	Dried tuber powder is used for the preparation of general tonic.
3.	<i>Bulbophyllum rufinum</i> Rchb. f.	Whole plant	Dried powder of the whole plant is used for the treatment of asthma and tuberculosis.
4.	<i>Calanthe sylvatica</i> (Thouars) Lindl.	Stem, Pseudobulb	Stem paste is used for the treatment of fractured and dislocated bones. Extract obtained from pseudobulbs is used for the treatment of nose and gum bleedings problems.
5.	<i>Cymbidium tigrinum</i> Par. ex Hook.	Root	Root is consumed to relieve fever and indigestion problems.
6.	<i>Cymbidium iridioides</i> D. Don	Leaf	Fresh juice of leaf is used to stop bleeding from the wound.
7.	<i>Dendrobium chrysanthum</i> Wall. ex Lindl.	Stem, Flower, Leaf	Stem and flower juice is used for the preparation of general tonic whereas leaf extract is used against fever.
8.	<i>Dendrobium crepidatum</i> Lindl. and Paxt.	Stem	Decoction of stem is used against diabetes and fever.
9.	<i>Dendrobium densiflorum</i> Lindl.	Pseudobulb	The pulp extracted from pseudobulbs is used for skin problems.

10.	<i>Dendrobium fimbriatum</i> Hook.	Leaf	Boiled leaves are consumed for boosting energy in the body.
11.	<i>Dendrobium heterocarpum</i> Wall.	Pseudobulb	Paste of pseudobulbs is applied on the wounded part to provide soothing effect and to reduce pain.
12.	<i>Dendrobium nobile</i> Lindl. (Yerum lei)	Stem	Powdered stem is used against stomachache problem whereas paste is applied on the cuts and wound for instant healing.
13.	<i>Dendrobium ochreatum</i> Lindl.	Leaf	Decoction of leaf is used against stomachache and vomiting.
14.	<i>Habenaria dentata</i> (Sw.) Schltr.	Whole plant	Decoction of whole plant is used against cold and cough.
15.	<i>Habenaria intermedia</i> D. Don	Tuber	Powdered tubers are used in asthma, cough and skin diseases.
16.	<i>Liparis viridiflora</i> Lindl.	Stem, Root	Stem and root decoction is used for the treatment of cough and sore throat.
17.	<i>Malaxis ophrydis</i> (J. Koenig) Ormerod	Flower	Flower powder is used as a tonic.
18.	<i>Pholidota pallida</i> Lindl.	Root, Pseudobulb	Juice extracted from roots and pseudobulbs is applied to relieve nasal, abdominal, rheumatic pain and its powder helps in treating insomnia.
19.	<i>Thunia alba</i> Lindley and Rehb. f.	Whole plant	Paste of whole plant applied to treat fracture and dislocated bones.

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