

Reduction In Orchid Diversity In Ultapani Forest Range Of Kokrajhar District Of Assam

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Abstract

Orchidaceae is well known as ornamental plant since long back, but it has a great contribution in the field of medicine as well. Diversity is considered as the natural home for all creatures viz. animate, inanimate, flora, fauna etc. of a region. Ultapani range has a great potential for exploration of orchid. Ultapani forest range consists of an area of about 224.64 Sq. Km. and is located in between N26°52'13.5" to N26°39'18.1" and E90°20'37.1" to E90°21'28.0". According to the survey of 2004 there are 24 species within 16 genus and according to the survey of 2014 there are 9 species within 8 genus. But in the present study it was found that the number of orchid in Ultapani range is reducing drastically day by day. Now Ultapani is left with 9 species within 5 genus. The orchids which are found in the region of Ultapani Forest Range have a long standing medicinal value. The paper will explore the data of species identified till date and its diversity in Ultapani forest range and also some of the vital challenges such as reduction, poaching, deforestation, habitat destruction etc. of present times.

Key words: Biodiversity, Orchid, Ultapani, Flora and Fauna, Reduction, Medicinal value.

• INTRODUCTION

Orchidaceae is one of the diverse and widespread family comprises more than 30, 000 species in approximately 750 genera distributed across the world (Kong *et al.*, 2003). It was estimated that about 1,300 species containing 140 genera of orchids are found in India (Johnson & Janakiraman, 2013). Out of these, 750 to 800 species found in NE region. Due to the prevailing congenial climatic conditions, diverse terrain and altitudinal variation majority of the orchid are constricted to the NE states (Dutta & Sarma, 2013). In Assam, more than 290 species of orchids are reported (Purkayastha, 2016). This represents 44.39% of North Eastern orchid species and 24.42% of species occurring in India.

Orchids have medicinal properties and biological activities, especially in the field of cancer, inflammation, neurodegeneration etc. and are well-known as folk medicines and also for their antimicrobial and antifungal activities. Orchids have a special characteristic of obtaining nourishment from fungus that grows on their roots. Ultapani is a semi evergreen and moist deciduous forest. Its name itself catches eye of many tourist. Unlike other rivers on the north bank of Brahmaputra, Ultapani flows from west to east and so it is named as "Ultapani".

Diversity is considered as the natural home for the flora and fauna of a region. Flora which are found in the region of Ultapani Forest Range has a long standing traditional value of its uses among the people residing in the area. The healers and the medicine practitioners have been using some wild orchid which has been traditionally used as a remedy to their physical illness. The long standing practice itself shows its ethno-botanical value and medicinal knowledge against some diseases.

• STUDY AREA

Out of 34 districts of Assam, Kokrajhar district falls in the north western part of Brahmaputra valley of Assam. Kokrajhar is bounded to the north, south, east and west by Bhutan, Dhubri, Chirang and by the state of West Bengal.

Kokrajhar district is situated in the last west part of Assam. It comprises of large and dense forests. It consists a geographical area of about 3498 sq. Km. (Basumatary, 2004). The selected area for this study is Ultapani Forest Range under Haltugaon Forest Division of Kokrajhar District of Assam. Ultapani Bazar is about 60.5 Km. from Kokrajhar town. Bishmuri is the connecting link between Kokrajhar and Ultapani, Which is about 33.9 Km. from Kokrajhar to Bishmuri and about 26.6 Km. from Bishmuri to Ultapani Bazar. Conventionally there are three forest divisions under Kokrajhar district namely Haltugaon Division, Kachugaon Division and Parbatjhora Division.

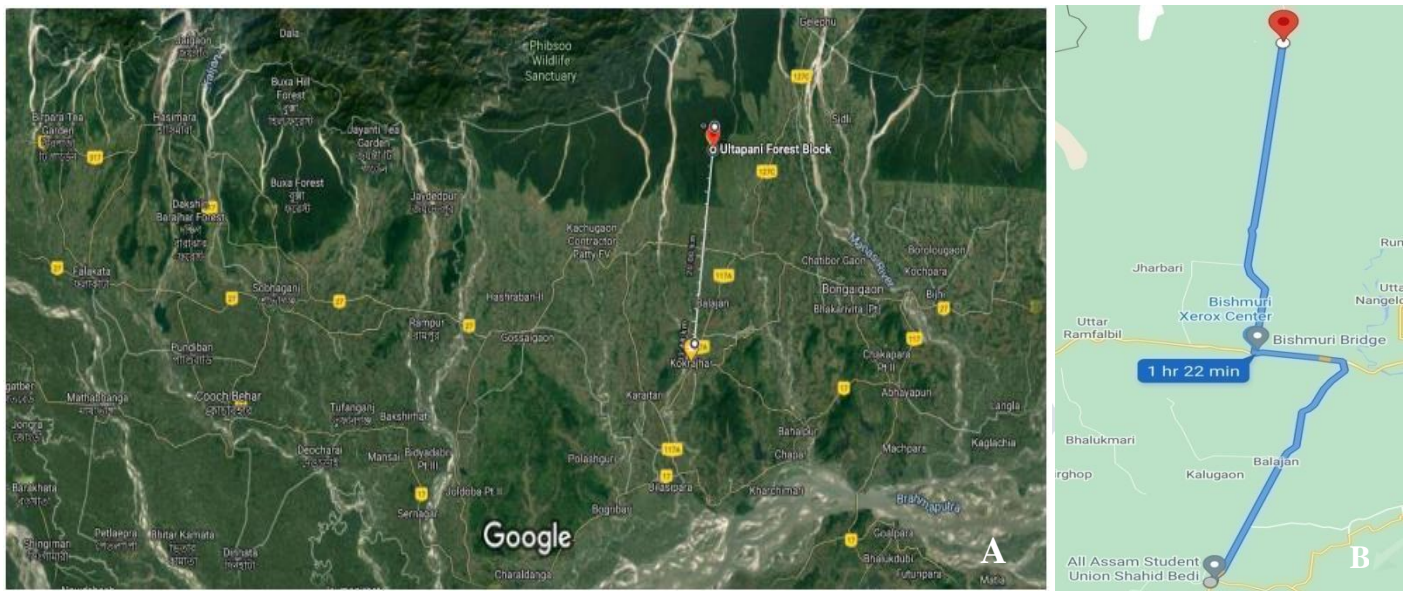


Figure 1: A. Satellite view of route distance from Kokrajhar town to Ultapani (Google, n.d.), B. Roadmap display of the same (Google, n.d.).

The geographical area of Haltugaon Division is 800 sq. Km. (approx). with N26°51'25.9", E90°15'25.5"; N26°52'08.7", E90°20'32.2"; N26°18'56.0", E90°22'56.4"; N26°22'02.7", E90°16'36.1". Later on a portion of area was bifurcated from Ultapani Range and merged with Chirang Division, Kajalgaon making it a total of 17000.00ha (about 12967.00ha in Chirang Reserve Forest; 2962.00ha in Manas Reserve Forest pt.; 1071.00ha in Bengtol Reserve Forest pt.).

There are four territorial ranges under Haltugaon Division. They are: Ultapani Range, Gaurang Range, Jharbari Range and Nayekgaon Range. Besides, there is one protection Squad Range and one Depot Office, Kokrajhar under Haltugaon Division.

The geographical area of Ultapani Range 224.64 sq. Km. (approx). with N26°52'13.5", E90°20'37.1"; N26°51'26.6", E90°15'23.4"; N26°44'24.0", E90°14'04.7"; N26°39'41.2", E90°17'49.0"; N26°39'18.1", E90°21'28.0". Though Ultapani is about 60.5 Km. from Kokrajhar town but the transportation system and network of Ultapani is very poor.





Figure 2: A. Entrance of Ultapani forest range, B. Greenery of Ultapani forest, C. Exceptionally tall trees of Ultapani, D. Dense forest of Ultapani, E. Flocks of Butterfly of Ultapani

• MATERIALS AND METHODS

Several methods have been adopted in this study. Most important method is analytical method and the study is comparative in nature. Present study has been started from the year 2019. Analysis have been done on the report of Basumatary, 2004 and report of Sarma, 2014. Final result has been deduced on the basis of comparative study among the report of Basumatary, Sarma and present collected species. Reduction is showed in the method of series of collection of orchid from the report of Basumatary to Sarma and present collection till 2019-21. As the area of study is on Ultapani Forest range thereby species have been collected from the Ultapani Forest range only. Several field surveys and series of meeting were conducted with the village head, Local people, forest rangers and the members of the forest office. Questionnaires have been made for collecting the data.

• HISTORICAL STUDY ON ORCHID OF ULTAPANI FOREST RANGE

Basumatary (2004) surveyed the area of Chirang Reserve Forest under Haltugaon Forest Division of Kokrajhar District and reported that 46 species within 26 genera of orchid were available in that area for that span of time among them 24 species were from Ultapani. The scientific names of those 24 species with genera are listed in the table1.

Table 1: Name of 24 species within 16 genus

Genus	Species
1. <i>Liparis</i>	1. <i>Liparis longipes</i> Lindl.
2. <i>Phaius</i>	2. <i>Phaius tankervilleae</i> (Aiton) Bl.
3. <i>Pholidota</i>	3. <i>Pholidota imbricata</i> (Roxb.) Lindl.
4. <i>Eria</i>	4. <i>Eria acervata</i> Lindl. 5. <i>Eria pumila</i> (Griff.) Lindl. 6. <i>Eria stricta</i> Lindl.
5. <i>Arundina</i>	7. <i>Arundina graminifolia</i> (D. Don) Hochr.
6. <i>Bulbophyllum</i>	8. <i>Bulbophyllum careyanum</i> HK. Spreng 9. <i>Bulbophyllum cauliformum</i> HK. f.
7. <i>Dendrobium</i>	10. <i>Dendrobium anceps</i> Sw. 11. <i>Dendrobium aphyllum</i> (Roxb.) C. E. C. Fisch. 12. <i>Dendrobium fimbriatum</i> Hook. var. <i>occulatum</i> Hook 13. <i>Dendrobium jenkinsii</i> Wall. Ex. Lindl. 14. <i>Dendrobium moschatum</i> Buch-Ham.
8. <i>Flickingeria</i>	15. <i>Flickingeria fugax</i> (Rechb. f.) Seid.

9. <i>Cymbidium</i>	16. <i>Cymbidium aloifolium</i> (L.) Sw.
10. <i>Acampe</i>	17. <i>Acampe papillosa</i> Lindl. 18. <i>Acampe rigida</i> (Buch.-Ham.) Hunt.
11. <i>Aerides</i>	19. <i>Aerides odoratum</i> Lour.
12. <i>Micropera</i>	20. <i>Micropera rostrata</i> (Roxb.) Balak.
13. <i>Pteroceras</i>	21. <i>Pteroceras suaveolens</i> (Roxb.) Holtt.
14. <i>Phalaenopsis</i>	22. <i>Phalaenopsis mannii</i> Reichb.f.
15. <i>Rhynchostylis</i>	23. <i>Rhynchostylis retusa</i> Bl.
16. <i>Smitinandia</i>	24. <i>Smitinandia micrantha</i> (Lindl.) Holtt.

But these orchids of Ultapani started to reduce in number with the passage of time due to various reasons. Since 2012-2014 Sarma started field survey and reported that only 9 species of orchid were available in Ultapani Forest Range (Sarma, 2014). The scientific names of those 9 species are listed in the table2.

Table 2: Name of 9 species within 8 genus

Genus	Species
1. <i>Arundina</i>	1. <i>Arundina graminifolia</i> (D. Don) Hochr.
2. <i>Dendrobium</i>	2. <i>Dendrobium aphyllum</i> (Roxb.) C. E. C. Fisch. 3. <i>Dendrobium nobile</i> Lindl.
3. <i>Bulbophyllum</i>	4. <i>Bulbophyllum careyanum</i> HK. Spreng
4. <i>Eria</i>	5. <i>Eria pubescens</i> (Hook.) Lindl. ex Loundon
5. <i>Rhynchostylis</i>	6. <i>Rhynchostylis retusa</i> (L.)Blume
6. <i>Calanthe</i>	7. <i>Calanthe masuca</i> (D. Don.) Lindl.
7. <i>Papilionanthe</i>	8. <i>Papilionanthe teres</i> (Roxb.) Schltr.
8. <i>Cymbidium</i>	9. <i>Cymbidium aloifolium</i> (L.) Sw.

In the present research, field survey and collection of Orchids started in 2019. Total of 9 species were found. The scientific names of those 9 species are listed in the table3.

Table 3: Name of 9 species within 5 genus

Genus	Species
1. <i>Dendrobium</i>	1. <i>Dendrobium fimbriatum</i> Hook. var. <i>oculatum</i> Hook.f. 2. <i>Dendrobium thyrsoflorum</i> B.S.Williams 3. <i>Dendrobium fugax</i> Rehb.f.
2. <i>Acampe</i>	4. <i>Acampe rigida</i> (Buch.-Ham. ex Sm.) P.F.Hunt 5. <i>Acampe praemorsa</i> (Roxb.) Blatt. & McCann
3. <i>Aerides</i>	6. <i>Aerides multiflora</i> Roxb.
4. <i>Rhynchostylis</i>	7. <i>Rhynchostylis retusa</i> Bl.
5. <i>Eria</i>	8. <i>Eria pubescens</i> (Hook.) Lindl. 9. <i>Eria lasiopetala</i> (Willd.) Ormerod

• HABITAT OF ORCHID

Above mentioned 9 species of wild orchids are epiphytic in nature. Normally they are found to be grown on plants of 8 feet or above in a big branch and in the joint of two or more branches. Most of these host trees are saal tree. Epiphytic orchids grow by attaching themselves to the bark of living trees, dying trees or, in rare cases, dead trees.

Normally orchids develop well in a region from sea level to at least 4,600 metres (15,000 feet) in elevation. Orchids prefer to bloom in cloud-forest, tropical regions. They grow vigorously in mountainsides where clouds kiss the mountain day and night. These forests have the abundance of mosses and lichens. Inclination of such forests is perfect for sunlight to penetrate through vegetation to the grouch. Such habitat is perfect for orchids to grow and bloom beautifully. Orchids that are found in rain forest have the tendency to grow in the top of huge trees in large quantity of a single species. Even there are species of orchids that are found to be epiphytic on cacti in desert conditions.



Figure 3: A Natural habitat of orchid in which they grow, B. Orchid on a tall tree, C. Blooming Orchids.

• REDUCTION OF ORCHID

There was a time when Ultapani was well known for its richness in orchid but with the passage of time unavailability of orchids were observed and so different measures need to be taken for its conservation. In 2004 24 species were reported from Ultapani but in the year 2014 it was reported that the availability of orchid got reduced to 9 species. Sadly orchids have not got the change to increase in number and in the present survey reduction of orchids were observed again and also species which were reported earlier, most of them have become unavailable now and were replaced by new species.

• CAUSES OF REDUCTION

Ultapani is considered as one of the virgin forests and is rich in biodiversity. Ultapani is a semi evergreen and moist type of forest. It consists of plants having high medicinal value, edible fruits, also some plants can yield oil and timber with high economic value. Ultapani is surrounded with wild and unexplored orchids, apart from orchids Ultapani have an image of heavenly existence for butterfly and so it is regarded as the “Heaven of Butterfly”. It is also well known for the natural home of Golden langur, Great Pied Hornbill and for some of the Rare Endangered Threatened (RET) species (Sarma, 2014). This mesmerizing biodiversity of Ultapani catches the eyes of visitors and hence was a very popular tourist spot. But now Ultapani is in danger because of its over exploitation. Deforestation for personal business purpose have ruined the valuable assets of this forest. Increase in human population and their poverty adversely affected the forestland.

As it was seen in the report of 2004 by Basumatary that 24 species of orchids were available in Ultapani but in the report of 2014 it was found that only 9 species were available in Ultapani. This decrease in orchid population was so fast that many species became rare, endangered and even extinct. In the present study only 9 species of orchid could be found and identified. The primary causes of reduction of orchid are habitat destruction. Exploitation of natural vegetation for timber, crop cultivation or forestry, or for industrial development has declined large population of orchid species of Ultapani. Man-made destruction of habitat not only destroys the places for the plants to live, but also causes loss of the orchid's pollinators, other plants, and fungi that they depend on. Over-collection is also one of the vital causes. In spite of various restrictions in over collection and illegal exportation of indigenous plants, the illegal and selfish practice is still going on damaging the population and longevity of orchids. Encroachers harm the forestland pathetically by forcibly trying to occupy the forest land.



Figure 4: A. Unauthorized settlement, B. Deforestation, C. Over exploitation, D. Habitat destruction, E. Illegal exportation, F. Encroachers affecting forestland ([BTC: Encroachers forcefully try to occupy forest land along Indo- Bhutan border, 16 arrested], 2021), G. Poaching(AIR News Guwahati, 2020), H. Poaching(AIR News Guwahati, 2020).

According to the data available in BTC with the forest department officials, a total of 39,750.86 hectares were under encroachment. About 2,385.14 hectares under Kachugaon forest division, 4,262.7 hectares in Dhansiri division, 8,894.21 hectares in Chirang division, 3,332.8 hectares in Porbotjhora division and 6,337.6 hectares in Baksa forest division are under encroachment. The Haltugaon division of Kokrajhar district has the highest record of encroachment of forestland with 14,538.41 hectares of land being encroached upon (Brahma, 2015). Moreover, as per many official data valuable trees like sal, titasapa and gamori are reported to be smuggled.

• ECOLOGY OF ULTAPANI FOREST RANGE

The ecosystem can be defined as a complex system where the species are depended on each other, having an interconnected network comprising biotic and abiotic elements. Biotic elements include all living organisms such as plants, animals and microorganisms. Abiotic elements, on the other hand, include non-living entities that are vital for the survival of life and these include soil, water, climate, etc. Among all biotic elements, Flora and Fauna are the most fascinating ones.

Flora and fauna are very important for human existence and they share a mutual relationship of respiration and photosynthesis. The Flora releases oxygen which is used by the fauna for respiratory activities. On the other hand Fauna, releases carbon dioxide which is used by the flora for photosynthesis.

Flora and Fauna is so much important and beneficial for mankind because of its medicinal value and food offerings. It is very much essential to maintain the balance of ecosystem and certainly this is the law of nature where the equilibrium is maintained by every species by predated on one another. Animals consume different plants and animals to balance their population on earth. Likewise the excretory products of animals are a very good source of fertilizer. The decaying products of dead animals are used as mineral supplement for other animals.

On the other hand because of Flora and Fauna the local economies are benefited through tourism. Flora and fauna being a part of the ecosystem are interdependent on each other for their survival. Besides, the extinction of a species from the chain of ecosystem adversely affects its balance causing trouble for the mother earth as well as for flora and fauna.

Plants are well known for its medicinal value but very few people know about the major contribution of orchids in the field of medicine. Apart from being ornamental plants orchids are very much rich in medicinal properties.

To prohibit the extinction of various flora and fauna and more specifically orchids various measures needs to be taken. Measures of species diversity play a central role in ecology and conservation biology (Magurran, 2013). Species diversity is an important parameter of a plant community, one of the major criteria for nature conservation and connected to ecosystem dynamics and environmental quality (Kalema, 2010). A change in species diversity is often used as an indicator of anthropogenic or natural disturbances in an ecosystem (Liu & Brakenhielm, 1996).

• SUMMARY/ SUGGESTIONS

Reduction of Orchidaceae is one of the major concerns for the ecology of Ultapani forest range. Every region is blessed with some unique characteristics and thus Nature maintains its diversity in various levels. Ultapani forest range is blessed with enumerable richness of orchid species as already mentioned in this paper. After a thorough study it is found that the vital reason behind reduction of orchid is artificial which is harmed by human being. Some section of people is destroying the ecology of Ultapani forest for the sake of better economic status only. Human development is a need of hour but without knowledge of the Nature and its mechanism such as ecology, diversity doesn't make any sense for humanity. It is also call of the Nature to understand that every creature has been created purposefully and beautifully in this earth not only for the Human being but also for the rest of the creatures living in this Earth. Inter-dependency is a natural principle that has to be maintained at any cost for survival of every creature.

Reduction is increasing surprisingly in Ultapani Forest because of settlement of people in the forest. For the purpose of settlement of people deforestation has been seen in many places. However, it has been observed that the settlement is not over populated in the forest. So, Government may take some measure to boost the natural resources of Ultapani by providing knowledge of natural resources including orchids to the people residing inside the forest only in view of employment generation services. Forest Tourism may be considered as one of the steps to conserve the orchid and other natural resources. Mawlynnong, the cleanest village of Asia of the Meghalaya State of the North East, India may be one of the Examples for Eco-Tourism or Forest Tourism. Tourism will provide new avenue to the people of the region and thus, they become the protector of their local resources. Thus, Ecology and Economy can go hand in hand which would be a significant step for Nature and Humanity.

Deforestation is to be strictly prohibited at any cost. As a result Orchidaceae and other natural resources would be conserved in a natural way. Hopefully, Orchidaceae will be the center of attraction for pharmaceutical companies and tourist in the Ultapani region.

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