DOCUMENTATION OF RARE AND ENDANGERED ORNAMENTAL FLORA IN FOREST RESERVES OF GARO HILLS, MEGHALAYA

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ABSTRACT

In the present investigation, a total number of 17 rare or endangered plant species have been recorded. The study of plant species highlights all the 17 rare or endangered plant species with their botanical names, family, habit and present scenario in all the districts of Garo Hills. Out of the 17 plant species, there was 5 plant species belonging to the family group of Droseraceae, Asclepiadaceae, Orchidaceae and Carryophyllaceae that have been listed in endangered category which requires an immediate attention for the conservation strategies. Many of the rare or endangered plants species can be found abundantly in the forest reserves of Nokrek National Park and Balpakram National Park area with a threatening situation. The best conservation area of the plant biodiversity was observed in the forest reserves such as the national parks, sanctuaries, biosphere reserves and sacred groves.

KEYWORDS: *Rare, Endangered, Plants, National parks, Garo Hills, Forest, Meghalaya*

Received: Dec 19, 2020; **Accepted:** Jan 09, 2021; **Published:** Feb 10, 2021; **Paper Id.:** IJBRJUN20214

INTRODUCTION

Meghalaya is among the few States in the country which can be proud of its abundance of natural forest wealth spanning across large part of its geographical area, much higher than national average. Its location, physiographical features, altitudinal variation, abundant rainfall, salubrious climate and fertile soils favours high species diversity and supports different types of forests. This rich flora had been the centre of attraction for many botanists starting from Buchanan Hamilton (1820-24) and rightly considered as 'Botanist Paradises'. This region was described by Hooker as "Cradle of Angiosperms". The undulating hilly terrain, where the plateau is dissected by rain-fed rivers, streams and deep ravines, waterfalls and hills covered with rich vegetation present picturesque landscape. The forests are also home to rare and endemic plants and animals. The undisturbed primary forests are botanically well known and extraordinarily rich. The forests of the state shelters more than 3500 flowering plants, 352 orchids, 40 bamboo species and about 800 medicinal plants resources. There are about 40 endemic plant species and 75 Threatened plant species found in Meghalaya. Amongst its rare species are the insect eating Pitcher plant (*Nepenthes khasiana* Hook f.), Wild citrus (*Citrus indica* Yu. Tanaka) and Pygmy Lily (*Nymphaea tetragona* L.).

MATERIALS AND METHODS

STUDY AREA

Meghalaya lies between 20.1 N' - 26.5 N' latitude and 85.49 E' - 92.52 E' longitude and it is known for its rich diversity of flora and fauna. The name Meghalaya means 'the abode of clouds' in Sanskrit and the state capital, Shillong is also known as the Scotland of the East. In Asia, the sub-tropical forest area of Meghalaya has been considered as one of the richest in botanical habitats. Since the climatic and topographic conditions are diverse in the forest

reserves of Garo hills, a vast floral diversity can be found in this region.

Garo Hills is situated in the western part of the state. The population is mainly dominated by the Garo tribe. Garo Hills usually receives extremely high rainfall and it has a very dense forest area cover. The average rainfall received annually is around 330 cm during the monsoon and the winter season is usually dry. The climatic condition in Garo Hills is majorly controlled by South-West monsoon winds and a fairly high temperature during summers. Garo Hills has two national parks, namely, Nokrek National Park and Balpakram National Park. Nokrek National Park is located in the western part of the state, whereas, Balpakram National Park lies on the southern part of the district. These National Parks protects a highly diverse flora and fauna that has been endangered due to over exploitation. The mountain peaks that are located in Garo Hills are called Tura Peak, Nokrek Peak, Meminram Peak, Nengminjok Peak, Chitmang Peak, Ranggira peak and Arbella peak. Nokrek peak is the highest point in Garo Hills with an elevation of 1412 meters above the sea level. Nokrek National Park is a home to the Indian wild orange (*Citrus indica*), which is the progenitor of citrus fruits. Balpakram National Park is known for its diverse wild animals and rich flora. Rare and endangered plant species namely, Drosera, pitcher plants and orchids can be found in this park.

METHODOLOGY

The present research was based on an extensive survey and observations of wild rare and endangered ornamental plants in different forest reserves of Garo Hills, Meghalaya during the year 2017-2019. In this investigation, diversity of rare and endangered wild ornamental flowering plants, which are distributed in the Garo Hills districts of Meghalaya were recorded. During the survey, the plant specimens were collected and preserved to prepare herbarium specimens. The collected specimens were identified taxonomically with the help of available floras and literature (Gamble & Fischer 1935, Pullaiah *et al.*, 1997, Reddy, *et al.*, 2008) and by Department of Botany, NEHU . The specimens were processed for the preparation of Herbarium by standard methods (Santapau, 1973).

STATUS OF RARE AND ENDANGERED WILD ORNAMENTAL FLORA OF GARO HILLS, MEGHALAYA

Some rare and endemic ornamental plant species from Garo Hills were *Hoya lanceolata* Hook, *Nepenthes khasiana* Griff, *Stellaria repens* Pers, *Scadoxus multiflora* Raf, *Nephelaphyllum pulchrum* Bl., *Begonia Roxburghii* Roxb, *Paphiopedulum venustum* Wall, *Hedychium gardenerium* Rose, *Eriocaulon orchinodes* Wall, *Drosera rotundifolia* L, *Kaempferia pulchra* Ridl, *Frinum cpitatum* Br., *Calanthe sylvatica* Lindl, *Curcuma picta* Roxb, *Alocasia furnicata* Schoot., *Curcuma zedoaria* Christm., *Curcuma montana* Roxb.

Table 1: Rare and Endangered plant species of Garo Hills, Meghalaya

S.No	Botanical Name	Family	Habit	Cause of Threat
1	<i>Alocasia furnicata</i> Schoot.	Araceae	Herb	Habitat loss, Road construction, over-exploitation
2	<i>Begonia Roxburghii</i> Roxb.	Begoniaceae	Herb	Exploitation for ornamental purpose
3	<i>Calanthe sylvatica</i> Lindl.	Orchidaceae	Terrestrial Herb	Exploitation for ornamental purpose
4	<i>Curcuma montana</i> Roxb.	Zingiberaceae	Herb	Habitat loss
5	<i>Curcuma picta</i> Roxb,	Zingiberaceae	Herb	Habitat loss

6	<i>Curcuma zedoaria</i> Christm.	Zingiberaceae	Herb	Habitat loss
7	<i>Drosera rotundifolia</i> L.	Droseraceae	Herb	Exploitation for ornamental purpose
8	<i>Eriocoulon orchinedes</i> Wall.	Erioculaceae	Herb	Exploitation for ornamental purpose
9	<i>Phrynium capitatum</i> Br.	Zingiberaceae	Herb	Deforestation
10	<i>Hedychium gardnerianum</i> Rose.	Zingiberaceae	Shrub	Deforestation
11	<i>Hoya lanceolata</i> Hook.	Asclepiadaceae	Creeper	Exploitation for ornamental purpose
12	<i>Kaempferia pulchra</i> Ridl.	Zingiberaceae	Herb	Deforestation
13	<i>Nephelaphyllum pulchrum</i> Bl.	Orchidaceae	Terrestrial Herb	Heavy exploitation in the past for ornamental purposes
14	<i>Nepenthes khasiana</i> Griff.	Nepentaceae	Creeper	Exploitation for ornamental purpose
15	<i>Paphiopedalum venustum</i> Wall.	Orchidaceae	Terrestrial Herb	Heavy exploitation in the past for ornamental purposes
16	<i>Scadoxus multiflora</i> Raf.	Amaryllidaceae	Herb	Exploitation for ornamental purpose
17	<i>Stellaria repens</i> Pers.	Caryophyllaceae	Lithophytic Herb	Exploitation for ornamental purpose

Table 2: Status of endangered ornamental flora of Garo Hills, Meghalaya

S.No	Botanical Name	Family	Status
1	<i>Alocasia furnicata</i> Schott.	Araceae	Rare
2	<i>Begonia Roxburghii</i> Roxb.	Begoniaceae	Rare
3	<i>Calanthe sylvatica</i> Lindl.	Orchidaceae	Rare
4	<i>Curcuma montana</i> Roxb.	Zingiberaceae	Rare
5	<i>Curcuma picta</i> Roxb,	Zingiberaceae	Rare
6	<i>Curcuma zedoaria</i> Christm.	Zingiberaceae	Rare
7	<i>Drosera rotundifolia</i> L.	Droseraceae	Endangered
8	<i>Eriocoulon orchinedes</i> Wall.	Erioculaceae	Rare
9	<i>Phrynium capitatum</i> Br.	Zingiberaceae	Rare
10	<i>Hedychium gardnerianum</i> Rose.	Zingiberaceae	Rare

11	<i>Hoya lanceolata</i> Hook.	Asclepiadaceae	Endangered
12	<i>Kaempferia pulchra</i> Ridl.	Zingiberaceae	Rare
13	<i>Nephelaphyllum pulchrum</i> Bl.	Orchidaceae	Endangered
14	<i>Nephenthes khasiana</i> Griff.	Nepentaceae	Rare
15	<i>Paphiopedalum venustum</i> Wall.	Orchidaceae	Endangered
16	<i>Scadoxus multiflora</i> Raf.	Amaryllidaceae	Rare
17	<i>Stellaria repens</i> Pers.	Carryophyllaceae	Endangered

Figure 1: Rare and endangered ornamental plant species of Garo Hills. 1.*Alocasia furnicata* Schoot. 2.*Begonia Roxburghii* Roxb. 3.*Calanthe sylvatica* Lindl. 4.*Curcuma montana* Roxb. 5.*Curcuma picta* Roxb. 6.*Curcuma zedoaria* Christm. 7.*Drosera rotundifolia* L. 8.*Eriocaulon orchinoides* Wall. 9. *Phrynium capitatum* Br. 10. *Hedychium gardnerianum* Rose. 11.*Hoya lanceolata* Hook. 12.*Kaempferia pulchra* Ridl. 13.*Nephelaphyllum pulchrum* Bl. 14. *Nepenthes khasiana* Griff. 15.*Paphiopedalum venustum* Wall. 16.*Scadoxus multiflora* Raf. 17.*Stellaria repens* Pers.

Figure 2: Number of rare and endangered plants based on their habit.

Figure 3: Status of rare and endangered species of Garo Hills.

RESULTS AND DISCUSSIONS

The results of the present research revealed that there were 17 plant species belonging to 10 families 15 genera (Table 1). Among 17 plant species, 12 species were herbs, 2 species were climbers and 1 species was shrub. Whereas, the highest number of rare and endangered ornamental plant species belonged to the family of Zingiberaceae, having 6 species, followed by Orchidaceae with 3 species. Among the 17 species which were divided into two categories of rare and endangered plant, the 12 plant species were listed in rare and 5 plant species were listed in endangered categories (Table 2).

CONCLUSIONS

The increase in population, over exploitation, natural calamities, man-made hazards etc. has become a serious threat to the biodiversity which has caused the wild species to get endangered. These findings will help in identifying the areas and the habitats of the rare and endangered species, so that these species will get priority for conservation. The Government of India as well as NGO's has taken steps in establishing several National parks, sanctuaries and biosphere reserves throughout the country. The *in situ* and *ex situ* conservation has also given a tremendous result in protecting the wild rare and endangered species. Public awareness, research and scientific technology will help in conservation of these species in the future. It is the need of an hour that the Government, the NGO's and the community make a joint effort for the best conservation of these species depending on the available resources.

ACKNOWLEDGEMENT

We are thankful to the Forest officials of Garo hills for providing the essential permit to conduct a successful survey for my research and helping in collection of wild indigenous flora of Orchidaceae and Zingiberaceae family in Garo Hills, Meghalaya.

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