ASSESSMENT ON ENDANGERED PLANT BIODIVERSITY OF SHIRUI NATIONAL PARK, UKHRUL, MANIPUR, INDIA

ABSTRACT:

Five different random sites were analyzed for the study of the plant species using quadrat methods from Shirui National Park. The plants were measured and recorded by random sampling with 20 quadrats of 10m ×10m in each study site during the period between January 2023 and April 2023.Site 4 Showed the maximum parameter for IVI value of Plant Species which was represent by *Bidens pilosa* with the value of 130.7 Site 5 Showed the minimum parameter for IVI value of Plant Species which was represent by *Llilium mackliniae* with the value of 24. The IVI results show that the plant species importance values differs from site to site. From the study *Llilium Mackliniae* (Shirui Lily) is found decreasing in population, a species which is only endemic to Shirui National Park, Manipur.

Keywords: *Conservation, Biodiversity, Shirui lily, Endangered, Ukhrul.*

1. INTRODUCTION:

Manipur is a land of Blue Hills and green valley. It is in the extreme northeastern border of India. According to 2011 census the total population is 28,55,794 lakhs. Different communities having their own language and culture are residing in the state. But the main language in the state is Meitei language. Shirui lily is the state flower of Manipur and this flower is found only in Ukhrul district. The Government of Manipur organized a festival in the name of this state flower called “Shirui festival” as a state function from 2017 onwards. The main theme of the festival is to conserve the flower as well as unite together all the communities through cultural exchange programmed and enhances the tourism industry in the state **(Devi , 2021**).

Biological diversity refers to the variety and variability among living organisms and the ecological complexes in which they occur **(Pullaiah *et al.,* 2015).** Anthropogenic activities are now-a-days prominent and causing extinction of many plant species of ecological and economic significance **(Choudhury and Khan, 2010).**

Understanding of the dynamics of plant resources is important for their sustainable management, utilization and biodiversity conservation **(Sarkar and Devi, 2014).** Forest plants are gathered for food, herbal medicine, spices, fuel, etc, which have built up their socio economic and cultural life **(Wangcha and Konyak, 2021).** The forests are the main repository of biodiversity and play an important role in maintaining the ecological balance of nature. The status of species diversity reflects the health of the ecosystem. **(Waponungsang *et al.,* 2021).**

The aim of the study is to understand and assess the population structure of the endangered plant biodiversity of Shirui National Park, Manipur. ***Llilium Mackliniae,*** state flower of Manipur is famous for it’s unique habitat, endemic to Shirui National Park, Manipur. The Northeastern region is also endowed with several plant and animal species of immense ecological and economic importance. These sources are under tremendous pressure and facing threats towards extinction.

2. MATERIALS AND METHODS

For the study of the plant species five random different sites selected from Shirui National Park, quadrat methods were used. The plants were measured and recorded by random sampling with 20 quadrats of 10m ×10m in each study site. All plants species recorded within each quadrat were identified then counted and estimated their cover percentage. The Importance Value Index (IVI) for the plant species was determined as the sum of the relative frequency, relative density and relative dominance **(Cottam and Curtis, 1956).**

2.1. Sampling Sites:

Shirui National Park, Ukhrul, Manipur within 24°13'51.0"N 94°13'51.0"E latititude and longitude at an elevation of 2,835 meters above sea level, with annual average rainfall of 1500 to 2000 millimeters. The climate of Shirui National Park is influenced by its Northeastern location and its elevation of Eastern Himalayas. In winter the climatic condition fall under 0^{o}C to 10^{o}C (32^{o}F to 50^{o}F) and 20^{o}C to30^{o}C (68^{o}F to 86^{o}F) during summer.

2.2 Map location of the study area:

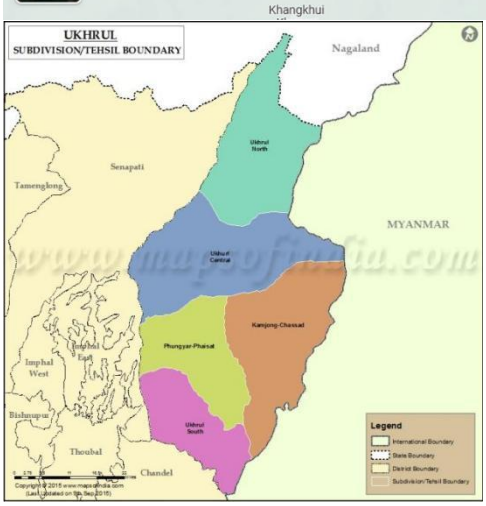

Fig 1:- Map of Ukhrul District and Shirui National Park

3. RESULTS AND DISCUSSION:

On the survey area of the Shirui National Park comprised of 10 species of plant species with a total number of 1607 individual belong to 7 families were found.

From the given table 1 Plant species having highest Frequency from each sites includes *Lilium mackliniae* (90) from site 1, *Curcuma rubescens* (90) from site 2, *Bidens pilosa* (100)

from site 3, Bidens pilosa (90) and *Artemisia Nilagirica* (95) from site 5. .Plant species having highest density from each sites includes *Lilium mackliniae* (6.1) from site 1, *Curcuma rubescens* (5.1) from site 2, *Bidens pilosa* (7.9) from site 3, *Bidens pilosa* (4.6) from site 4 and *Artemisia Nilagirica* (6.1) from site 5. Plant species having highest abundance from each sites includes *Lilium mackliniae* (6.4) from site 1, *Lilium mackliniae* (6) from site 2, *Bidens pilosa* (7.9) from site 3, *Bidens pilosa* (5.1) from site 4 and *Artemisia Nilagirica* (6.4) Plant species having lowest Frequency from each sites includes *Dendrobium densiflorum, Dendrobium nobile* and *Rhdodendron arboretum* having the same value (70) from site 1, *Dendrobium densiflorum* (70) from site 2, *Lilium mackliniae* (80) and *Plantago erosa* (80) from site 3 and *Lilium mackliniae* (45) from site 5. Plant species having lowest density from each sites includes *Rhdodendron arboretum* (1.8) from site1, *Dendrobium nobile* (2.4) from site 2, *Lilium mackliniae* (3.7) from site 3 , *Lilium mackliniae* (2.3) from site 4 and *Lilium mackliniae* (45) from site 5. Plant species having lowest Abundance from each sites includes *Rhdodendron arboretum* (2.5) from site 1, *Dendrobium nobile* (3) and *Rhdodendron arboretum* (3) from site 2, *Lilium mackliniae* (4.6) from site 3, *Plantago majo*r (3.3) from site 4 and *Lilium mackliniae* (1.8) from site 5

From the given table 1 it can be concluded that the value for frequency, density and abundance of the plant species are low in the study sites. **(Aigbe and Omokhua, 2015)** reported that **t**he population density and abundance of a tree species in a patch of rainforest is substantially affected by the atmospheric conditions inside the forest and the number of seeds capable of surviving generated by the tree in question. **(Christie and Armesto,.2003)** gave an account of very low population densities and abundance of a vast number of economically viable tree species triggered by death of viable seeds and poor micro-sites for rejuvenation.

The plant species differ are from site to site, however *Lilium mackliniae* occurred to be found is all the five sites of the study area but the value of each site are differ from one another, *Biden pilosa* and *Plantago major* and *Rhdodendron arboretum* are occurred to be found in three different site, *Curcuma rubescens, Dendrobium densiflorum, Dendrobium nobile* are occurred to be found in two different sites and *Plantago erosa, Artemisia Nilagirica, Eupatorium Adenophorim* are occurred to be found in only one site. **(Ojo, 2004)** revealed the occurrence of high number of species in these families may be as a result of their mechanism of seed dispersal such as explosive mechanism and wind dispersal, where they germinate when conditions are suitable. However, less number of species noticed in some families may be as a result of poor germinability as seeds may require scarification or changes in thermal or light conditions to break dormancy or quiescence for germination to occur. **(Pausas and Austin,. 2001)** reported such need on species richness in connection to the environment.

From the given table 1 the highest Important Value Index of the plant species from each site includes *Lilium mackliniae* (90.5) from site 1, *Curcuma rubescens* (77.1) from site 2, *Bidens pilosa* (104) from site 3, *Bidens pilosa* (130.7) from site 4 and *Artemisia Nilagirica* (92.4) from site 5. The lowest Important Value Index of the plant species from each site includes *Rhdodendron arboretum* (40.7) from site 1, *Dendrobium nobile* (47.1) from site 2, *Llilium mackliniae* (62.7) from site 3, *Lilium mackliniae* (82.85) from site 4 and *Lilium mackliniae* (24.6) from site 5.

Importance Value Index (IVI) is used as a quantitative parameter that can express the level of dominance (level of control) of species in a community. The plant species that have the highest IVI are due to their higher density, frequency, and dominance than other types. The higher the IVI of a species, the higher the level of control in the community of that species grows, Similar result was conducted by another Author **(Sosilawaty *et al,.* 2021),** on the other study **(Narayan and Anshumali,. 2015)** revealed that the IVI values show variation in ecologically dominant from site to site. Hence, the IVI has helped in understanding the ecological significance of the species in the tropical dry deciduous forest.

Table 1 Quantitative analysis of plant species of Site 1,2,3,4 and 5 are as categorized below:-

D- Density, F- Frequency, RF- Relative frequency; RD- Relative Density; RDo- Relative Dominance; IVI- Importance Value Index.

Species	F	D	A	RF	RD	RDo	IVI
Site 1							
Curcuma rubescens	85	4.5	5.3	22	26.7	24.7	73.6
Dendrobium densiflorum	70	2.4	3.5	18.1	13.9	15.8	48.2
Dendrobium nobile	70	2.3	3.5	17.1	13.6	16.3	46.8
Rhdodendron arboretum	70	1.8	2.5	18.1	10.7	11.8	40.7
Lilium mackliniae	90	6.1	6.4	23.3	35.5	31.2	90.5
Site 2							
Curcuma rubescens	90	5.1	5.6	22.2	28.7	26	77.1
Dendrobium densiflorum	70	2.8	4	17.2	16.10	18.7	52.1
Dendrobium nobile	80	2.4	3	19.7	13.4	13.8	47.1
Rhdodendron arboretum	85	2.5	3	20.9	14	13.8	49.2
Lilium mackliniae	80	4.8	6	19.7	27	27.6	74.4
Site 3							
Bidens pilosa	100	8	7.9	28.9	40	35.3	104
Plantago major	85	4.2	5	24.6	21	22	68.04
Lilium mackliniae	80	3.7	4.6	23.1	18.7	20.7	62.7
Plantago erosa	80	3.9	4.9	23.1	19.7	21.8	64.8
Site 4							
Bidens pilosa	90	4.6	5.1	39.13	48.9	42.66	130.7
Plantago major	75	2.5	3.3	32.61	26.5	27.5	86.44
Lilium mackliniae	65	2.3	3.6	28.26	24.4	29.8	82.85
Site 5							
Eupatorium Adenophorim	90	3.8	4.2	18.5	23.9	22.8	65.34
Lilium mackliniae	45	0.8	1.8	9.2	5.2	10.06	24.6
Plantago Major	80	1.6	2.0	16.5	9.9	10.66	37.12
Bidens Pilosa	90	1.8	2.0	18.5	11	10.66	40.43
Artemisia Nilagirica	95	6.1	6.4	19.5	38	34.5	92.4
Rhdodendron Arboretum	85	1.8	2.1	17.5	11	11	40.03

CONCLUSION

In this present study, it revealed that the plant species were mostly low in their distribution and scantily populates the study area; this may result from the unrestrained exploitation. For reason, annually during the month of January the villagers burn down the main core area of grassland in order to minimize the other competitive species of *Lilium Mackliniae*, this result

to the declination of other plant species. To make it possible to prevent the continuos decline of various other plant species; there is need for more effective measures of the forest by the indigenous communities.

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