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SPECIES DIVERSITY OF BUTTERFLIES AT CHOWANNUR VILLAGE, THRISSUR, KERALA

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Abstract: This perception is held, in a spot called Chowannur, in the Thrissur District of Kerala. The acknowledgment that reports 110 sorts of butterflies under 5 families . The examination uncovers that Nymphalidae Family (brush-footed butterflies) overwhelms the fauna of this place with 42 species. Papilionidae (swallow-tails)are with 12 species, Pieridae (whites and yellows) with 26 species, Hesperidae (captains) with 19 species and Lycaenidae (blues) is with 13 species. Among these families bounty of butterfly species in many ludicrous in timber land with 47 species, trailed by Agri field (40 species) and lake locale (36 species), meadow (32 species) mountain zone (30 species), in perspective on IUCN list. Butterflies were seen as ought not out of the common (C), 49 species, uncommon (UC) 23 species, and 4 species under rare (R) category. Since there are endemic host plants in the timberland, the ensured zone, there are more butterflies, following the agrifield and the lakeside. As in the perspective on standard speedy, the Postmonsoon (oct-Jan) records more butterfly species, trailed by premonsoon (Feb-may) and monsoon (jun-sep) seasons. In the postmonsoon, the Family Nymphalidae (brush-footed butterflies) overwhelmed the butterfly fauna of Chowannur with 41 species, trailed by Pieridae (whites and yellows) with 29 species, Hesperidae (skippers) with 21 species, Lycaenidae (blues) of 13 species and Papilionidae (swallow-tails) with 12 species.

Keywords: *Nymphalidae, Pieridae, Hesperidae, Papilionidae, Lycaenidae*

I INTRODUCTION

A rich organic framework vouches for the closeness of extended lives, especially littler scale living things. Butterflies structure unavoidable bit of the ensured condition in any place. Many of butterfly species are cautiously periodic and lean toward only a particular course of action of normal surroundings [1] and they are incredible markers with respect to anthropogenic agitating impact and living space quality [2]. World Survey of butterflies which go under the sub family Rhopalocera are of 17,200 species. The most prompt sensible records of the butterflies of Western Ghats return to the eighteenth century records by Linnaeus, Fabricus and Cramer. Starting now and into the foreseeable future, there have been various assessments on butterflies from different bits of the southern India [3-4]. India has approximately 1,800 species and

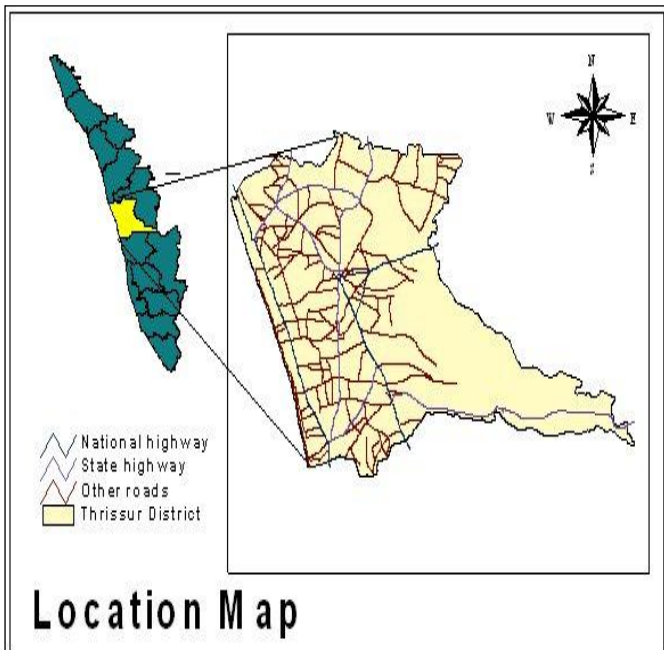
subspecies of butterflies and in these 15–20 % are endemic to the Indian area (Kunte et al., 2016) [4] and 316 species have been represented from Kerala (Palot et al., 2012) [5]. Kerala is the southernmost region of India, existing in the tropical region. With a high thickness of masses this is a spot that is known for living separately of individuals and various creatures. Among them the most appealing and captivating are apparently these butterflies.

The crucial driver for the rot of butterfly masses are deforestation, characteristic surroundings destruction for urbanization, industrialization and agriculture causes changes in temperature, Humidity and precipitation. Normality of terrible atmosphere conditions often impact condition suitability inciting neighborhood end of butterflies. (Lekshmi priya et al., 2017) [6] This article is an individual enquiry into the lives of

butterflies in Chowannur. The assessment plan was to perceive if this region was suitable for the advancement and flourishing of butterflies. Recalling this motivation the investigation was coordinated in this place and different species of butterflies were recognized and considered. This article would show that the region, as inspected, is a home for lots of butterflies.

Butterflies are the most enchanting and incredible creatures among the insect species, they are as often as possible seen as lead species. Butterflies are fragile biota, which get truly impacted by characteristic assortments and changes in woods structure (K.S. Aneesh)[7]. Butterflies have been seen as the picture of wonderfulness and ease (Rafi et al., 2000) [8]. They are the best known insects due to their diurnal characteristic environment and expeditiously saw by their unbelievable tints, amazing shapes and smooth flight give pleasure to everyone (Javaid, 1978) [9]. These are possibly the most considered and without a doubt comprehended frightening little creature social affairs. The greatest insect family Lepidoptera which has got two subdivisions called Rhopalocera and Heterocera. Rhopalocera links butterflies and Heterocera, the moths. In terms of pointer living creatures for biodiversity analyzes, butterflies are an amazing choice as they are typical everywhere, engaging and easy to watch. The research locales engage the raising and prevailing of butterflies.

II STUDY AREA



Chowannur gives an encompassing that is appropriate for the development of butterflies. There are a lot of vegetation in this territory since there is leftovers of muddy salt land that are still observed.

Various sorts of biological systems are watched. Prairie, just as the mountain zones, lake side, farming fields, and furthermore woods environment, are found. The geology gives demonstrates to the way that there had been steady water stream and plenteous wetland. There are butterflies, moth and different animals making this their home. The most critical factor which empowers butterflies to live here is presumably the accessibility of water and salt swamps. In that manner, the land gives a functioning living territory to butterflies. The abiotic components like rainfalls, Temperature, Humidity and wind speed Which make chowannur as a commonplace for the development of Butterflies. The temperature of the investigation region during the review was 28 degrees C. The Wind Speed was at 8 km/h. Normal Humidity was 83%. Weather particularly Temperature, Wind Speed and Humidity ImpaCT Butterfly life and exercises.



Weather 28°C, Wind E at 8 km/h, 83% Humidity

Chowannur (Malayalam: ചൊവ്വന്നൂർ) is a place in Thrissur district, state of Kerala, India.

III METHOD AND MATERIALS

The examination was directed from January 2016 to January 2017, during which time the month to month visits zone were made. During consistently a two-hour transect was strolled in the first part of the day from 08:00–10:00 hr. During this transect, the butterfly species experienced were reported and the quantity of people was tallied. Endeavor was additionally made to photograph documentation of the various types of butterflies. The camera utilized for accumulation is Nikon, D90, DT50 with the focal point of 200 mm and 500mm. The butterflies were distinguished utilizing the field aides of Kunte (2000). Scientific categorization and the classification pursued is that of Kunte et al. (2016). The wealth of the butterflies were determined utilizing the accompanying technique. Species watched 80–100 % of the study days were sorted as extremely normal (VC), 20% as uncommon (VR) (after Aneesh et al. 2013). We would prefer to keep up the arrangement Common (C) Uncommon (UC) and Rare (R). Recorded photographs are appended for better investigation and results.

IV RESULT AND DISCUSSIONS

There is is one of the five Heritage destinations of Kerala ,whichi is a Temple Grove called Kalashamala that spread over 3.5 acres of land and is stuck with 110 basically imperiled tree species, named *Syzygium travevencuricum*. which is incorporated into the IUCN Redlist. A sum of 110 types of butterflies having a place with 5 families were recognized from the Narimadakkunnu. In this Sahyadri Birdwing ,*Troides minos* species is endemic toward the Western Ghats. 3 types of the butterflies found here have been recorded in the timetables of the Wildlife Protection Act, 1972. Those are Gray tally(*Tanaecia lepidea*), Crimson Rose (*Pachliopta Hector*), Common baron(*Euthalia aconthea*)are incorporated into the Schedule I .

SEASOSAL SIGNIFICANCE OF THE STUDY SITE

The observations are carried out on the basis of three seasons named as season A,B and C.

Summer Season (Premonsoon A)

When compared to other states in India, Summer in Kerala is moderate. It is the Western ghats that prevents the entry of the dry northern winds. In addition to that the cool breeze from the Arabian sea blowing towards this small green land make the summer pleasant. Sudden downpours and thunderstorms occur in Summer.

Avg Temperature during Summer in Kerala:	Maximum:36°C Minimum : 32°C
Avg Rainfall during the season :	135 mm

Monsoon Season(Monsoon B)

By the end of May or beginning of June the scenario changes completely. This is the time for monsoon in Kerala. In this season the climate is dark and cold. Wind from Southwest begins to flow from the oceans, the clouds cover the sun and the rain begins to pour. The southwest monsoon lasts till August and there is a pleasant interval of two months before north-east monsoon. The weather at this time is nice. This is the harvesting time in Kerala. The north east monsoon is different with thunder and lightning.

Average Temperature during this season :	Maximum:30°C Minimum : 19°C
Average Rainfall during the season :	2250 - 2500 mm

Winter Season(Post monsoon C)

The winter in Kerala is cool with the temperature falling up to 25 degree centigrade. Mornings are pleasant with the fog covering the trees and buildings. Also, Winter is the time for major pilgrimages and festivals in Kerala.

Temperature during Winter in Kerala:	Maximum : 28°C Minimum : 18°C
Average Rainfall during the season :	25 mm

In the season A, the butterflies are less due to heavy fall of rain.Season A starts with May and end in August.Season B starts with September,ends in December.This the post monsoon season where a plenty of butterflies are seen. Here in the studyarea.The third season C which otherwise called as premonsoon or summer season,butterflies are seen in amoderate level.Apart from these , some butterflies are seasonal.

A Checklist of Butterflies of Chowannur, Kunnankulam , Thrissur, Kerala.

Table I

	Common Name	Scientific Name	S1	S2	S3	Status
	FAMILY : NYMPHALIDAE					
1.	Black rajah**	<i>Charaxes solon</i>	√		√	Uncommon
2.	Black vein sergeant **(SC-II)	<i>Athyma ranga</i>		√	√	Uncommon
3.	Blue pansy*	<i>Junonia orithya</i>	√	√	√	Common
4.	Blue tiger *	<i>Thirumala liminiace</i>	√	√	√	Common
5.	Chestnutstreakedsailor*(SCII)	<i>Neptis jumbah</i>	√	√	√	Common
6.	Chocolate pancy*	<i>Junonia iphita</i>	√	√	√	Common
7.	Clipper **(SCII)	<i>Parthenos sylvia</i>	√		√	Uncommon
8.	Club beak **	<i>Libythea lepita</i>	√		√	Uncommon
9.	Commander *	<i>Limenitis procris</i>	√	√	√	Common
10.	Common banded sailer *	<i>Neptis hylas</i>	√	√	√	Common
11.	Common baron***(SCII)	<i>Euthalia aconthea</i>			√	Rare
12.	Common Bush Brown**	<i>Mycalesis perseus</i>	√	√	√	Common
13.	Common Castor**	<i>Ariadne merione</i>		√	√	Uncommon
14.	Common evening brown*(SCII)	<i>Melanitis leda</i>	√	√	√	Common
15.	Common five ring **	<i>ypthima baldus</i>		√	√	Uncommon
16.	Common Indian crow *(SCII)	<i>Euploea core</i>	√	√	√	Common
17.	Common Lascar n**	<i>Pantoporia hordonia</i>	√		√	Uncommon
18.	Common Leopard n**	<i>Phalantha phalantha</i>	√		√	Uncommon
19.	Common Nawab**	<i>Polyura athamas</i>		√	√	Uncommon
20.	Common Palm fly **	<i>Elymnias hypermnestra</i>		√	√	Uncommon
21.	Common Sailor n**	<i>Neptis hylas</i>		√	√	Uncommon
22.	Common Seargeant n**	<i>Athyma perius</i>		√	√	Uncommon
23.	Dark banded bush brown** (SCII)	<i>Mycalesis orcha</i>		√	√	Uncommon
24.	Danaid Egg fly*(SCII)	<i>Hypolimnas missippus</i>	√	√	√	Common
25.	Dark blue tiger *	<i>Thirumala septentrionis</i>	√	√	√	Common
26.	Dark evening brown** (SCII)	<i>Melanitis leda</i>		√	√	Uncommon
27.	Glad eye bush brown **	<i>Mycalesis patina</i>	√		√	Uncommon
28.	Glassy tiger *	<i>Parantica aglea</i>	√	√	√	Common
29.	Great egg fly *	<i>Hypolimnas bolina</i>	√	√	√	Common
30.	Grey count*** (SCII)	<i>Tanaecia lepidea</i>			√	Rare
31.	Grey pansy *	<i>Junonia atlites</i>	√	√	√	Common
32.	Lemon pancy *	<i>Junonia lemonias</i>	√	√	√	Common
33.	Malabar Tree Nymph *	<i>Idea malabarica</i>	√	√	√	Common
34.	Nigger *	<i>Orsotrioena medus</i>	√	√	√	Common
35.	Peacock pansy **	<i>Junonia almana</i>	√		√	Uncommon
36.	Plain tiger *	<i>Danaus chrysippus</i>		√	√	Uncommon
37.	South Indian Blue oak leaf**	<i>Kallima horsfieldi</i>	√		√	Uncommon
38.	Southern Rustic *	<i>Cupha erymanthis</i>	√	√	√	Common

39.	Striped tiger *	<i>Danaus genutia</i>	√	√	√	Common
40.	Tamil Yeoman**	<i>Cirrochora thais</i>	√		√	Uncommon
41.	Tawny coster *	<i>Acraea violae</i>	√		√	Uncommon
42.	Yellow Pansy*	<i>Junonia hierta</i>	√	√	√	Common
	FAMILY: PAPILIONIDAE					
43.	Blue mormone **	<i>Papilio polymnestor</i>		√	√	Uncommon
44.	Common blue bottle **	<i>Graphium doson eleius</i>	√		√	Uncommon
45.	Common mormon*	<i>Papilio polytes</i>	√	√	√	Common
46.	Common rose *	<i>Pachilocta hector</i>	√	√	√	Common
47.	Crimson rose***	<i>Pachliopta hector</i>			√	Rare
48.	Five bar swordtail**	<i>Graphium antiphates</i>	√		√	Uncommon
49.	Great mormon **	<i>Papilio mermon</i>		√	√	Uncommon
50.	Lime butterfly **	<i>Papilio demoleus</i>		√	√	Uncommon
51.	Malabar Banded swallowtail**	<i>Papilio liomedon</i>		√	√	Uncommon
52.	Red Helen**	<i>Papilio helenus</i>		√	√	Uncommon
53.	Southern Birdwing**	<i>Troides minos</i>	√		√	Uncommon
54.	Tailed jay *	<i>Graphium agamemnon</i>	√	√	√	Common
	FAMILY: PIERIEDAE					
55.	Chocolate albatross**	<i>Appias lyncida</i>	√		√	Uncommon
56.	Common albatross *	<i>Appias albina</i>	√	√	√	Common
57.	Common grass yellow *	<i>Eurema hecabe</i>	√	√	√	Common
58.	Common jezebel*	<i>Delias eucharis</i>	√	√	√	Common
59.	Lemon emigrant *	<i>Catopsilia Pomona</i>	√	√	√	Common
60.	Mottled Emmigrant*	<i>Catopsilia Pyranthe</i>	√	√	√	Common
61.	Plain Puffin**	<i>Appias indra</i>	√		√	Common
62.	Psyche *	<i>Leptosia nina</i>	√	√	√	Common
63.	spotless grass yellow *	<i>Eurema laeta</i>	√	√	√	Common
64.	Striped albatross**	<i>Appias libythea</i>	√	√		Uncommon
65.	Yellow orange tip*	<i>Ixias pyrene</i>	√	√	√	Common
	FAMILY: LYCAENIDAE					
66.	Angled pierriot**	<i>Caleta caleta</i>	√	√	√	Common
67.	Blue banded pierriot**	<i>Talicauda nyseus</i>		√	√	Common
68.	Centaur oak blue ***	<i>Thaduk multicaudata</i>			√	Rare
69.	Common Acacia blue *	<i>surendra quercetorum</i>	√	√	√	Common
70.	Common cerulean*	<i>Jamides celeno</i>	√	√	√	Common
71.	Common hedge blue**	<i>Actolepis puspa</i>	√		√	Uncommon
72.	Common imperial *	<i>Cheritra freja</i>	√	√	√	Common
73.	Common lime blue *	<i>Prosotas nora</i>	√	√	√	Common
74.	Common silverline *	<i>Spindasis vulcanus</i>	√	√	√	Common
75.	Dark Cerulean *	<i>Jamides bochus</i>	√		√	Common
76.	Eastern Plain Hedgeblue*	<i>Celastrina l. Limbatus</i>	√	√	√	Common

77.	Forget-me-not**	<i>Catochrysops strabo</i>	√		√	Common
78.	Gram blue**	<i>Euchrysops cnejus</i>	√		√	Uncommon
79.	Grass Jewel *	<i>Freyeria trochylus</i>	√	√	√	Common
80.	Lime Blue*	<i>Chlades lajus</i>	√	√	√	Common
81.	Many Tailed Oak Blue n**	<i>Thaduka multicaudata</i>	√		√	Uncommon
82.	Metallic Cerulean*	<i>Jamides alecto</i>	√	√	√	Common
83.	Monkey Puzzle	<i>Rathinda amor</i>	√	√	√	Common
84.	Plain hedge blue*	<i>celestrina lavedularis</i>	√	√	√	Common
85.	Quaker *	<i>Neopithecops zalmora</i>	√	√	√	Common
86.	Red Pierriot**	<i>Talicada nyseus</i>		√	√	Uncommon
87.	short banded cerulean**	<i>Jamides celeno</i>	√	√	√	Common
88.	Slate Flash**	<i>Rapala manea</i>		√	√	Uncommon
89.	Tiny Grass Blue *	<i>Zizula hylax</i>	√	√	√	Common
90.	Yamfly *	<i>Loxura atymnas</i>	√		√	Uncommon
91.	Zebra Blue*	<i>Leptotes plinius</i>	√	√	√	Common
	FAMILY:HESPERIDAE		√	√	√	Common
92.	Banded Awl*	<i>Hasara chramus</i>	√	√	√	Common
93.	Brown Awl*	<i>Badramia exclamationis</i>	√	√	√	Common
94.	Chestnut bob**	<i>Iambrix salsala</i>	√	√	√	Common
95.	Common Awl*	<i>Hasara badra</i>	√	√	√	Common
96.	Fulvous Pied Flat*	<i>Pseudocola deniadan</i>	√	√	√	Common
97.	Giant red eye*	<i>Gangara thyrsis</i>	√	√	√	Common
98.	Grass demon**	<i>Udaspes folus</i>	√	√	√	Common
99.	Immaculate largeSnow flatt**	<i>Tagiades gana</i>	√		√	Uncommon
100.	Indian Grizzled Skipper*	<i>Sipalia galba</i>	√	√	√	Common
101.	Indian Palm bob**	<i>Suastus gremius</i>	√		√	Uncommon
102.	Oriental Grass Dart**	<i>Taratrocera m.sagara</i>	√		√	Uncommon
103.	Restricted demon **	<i>Notocrypta curvifascia</i>	√		√	Uncommon
104.	Rice swiftt *	<i>Borbo cinnara</i>	√	√	√	Uncommon
105.	Smaller Dartlett**	<i>Oriens Goloides</i>	√		√	Uncommon
106.	Spotted Small flat **	<i>Sarangesa purendra</i>	√		√	Uncommon
107.	Tricoloured piedFlat**	<i>Coladenia indrani</i>		√	√	Uncommon
108.	Water snow flat**	<i>Tagiades litigiosa</i>		√	√	Uncommon
109.	Common Grass Dart**	<i>Taratrocera maevius</i>	√		√	Uncommon
110.	Coon**	<i>Psolos fuligo</i>	√		√	Uncommon

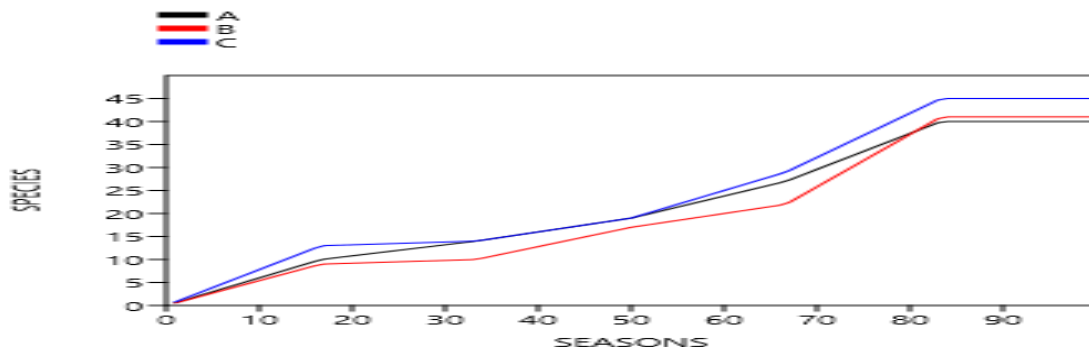
The present study that reports 110 types of butterflies (table I)from Narimadakkunnu, uncovers the biodiversity centrality of this region, which is a sanctuary for hordes of butterflies. Butterflies were distinguished as Common, 60 species, Uncommon (UC) 46 species, and 4 species under Rare classification and recorded pictures are appended and number as appeared

in the table. Butterfly dispersion is relied upon to mirror the appropriation of their host plants even at scales and kind of vegetation may reflect the contrast in the piece of butterfly species among living spaces at the nonexclusive and family level (Ramesh et al.) [13]. Seasonals perceptions are organized as in the table(Table II). *Athyma ranga,Tanaecia lepedia,*

Euchrysops nejus nejus, *parthenos* *Sylvia*, *Myclesis orcha*, *Appias lyncida*, *appias indra*, *Apiaslybetheya*, *Euploea core*, *Baoris farii*, *Euploea klugii*, *Euthalia*
 Study region indicated a lesser number of Papilionidan

species, where Nymphalidans and Pieridans are increasing numbers in records. The accompanying Graphical chart (Graph I) gives the data with respect to occasionally reported:

Graph I



Butterfly species. Spread flies have appeared in plenitude October-January (post-monsoon) months. Migratory Butterflies are additionally viewed during the long stretch of October – November. After the long stretches of June and July, various species are recorded. During a rainstorm, those are less in number yet from August and September those are more in occurrence. The Premonsoon (Feb-May) season is the normal season for butterflies here.

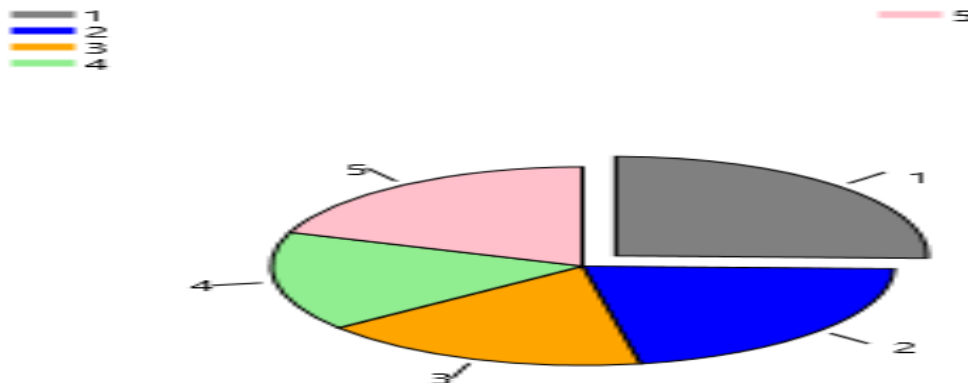
Table II

SEASONAL OBSERVATIONS OF BUTTERFLY SPECIES					
S.NO.	FAMILY	FEB-MAY	JUN-SEP	OCT-JAN	AVERAGE
		PRE MON A	MONSOON B	POST MON C	
1	NIMPHALIDAE	40	41	45	42
2	PAPILIONIDAE	14	10	14	12
3	PIERIDAE	27	22	29	26
4	LYCAENIDAE	10	9	13	11
5	HESPIRIDAE	19	17	19	19
	TOTAL	109	99	117	110

Table III

SITES	No. of Species
TIMBER iLAND i(GI)	63
AGRI-FIELD(GII)	80
MEADOW i(GIII)	28
MOUNTAINZONE i(GIV)	31
LAKE iLOCALE i(GV)	55

Graph III



The above (Table III) and Graph II gives the site shrewd event of butterflies from the examination area. Among these plenitude of butterfly species were watched most extreme in timberland zone with 80 species, trailed by agrifield (63 species) and lake locale (55 species), meadow (28 species) mountain zone (31 species), based on IUCN list.

V CONCLUSION

The diversity of assorted species were decidedly influenced by moving toward summer, high relative moistness and more precipitation. Butterfly assorted variety in a round about way mirrors a general decent variety of plants, particularly herbs and bushes in a given area. Biological decent variety of a territory is intently connected with the impact of human-centric improvements. It must be additionally said that there is a disturbing pace of increment in urban improvement programs and thus together with it a higher pace of air contamination which results in complete aggravation of

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the environment and eradication of different species. The investigations have been finished during 2016-18 and now this legacy territory is experiencing further advancement programs. The spot has just attempted by Ecotourism department by the administration of Kerala government. Day by day new developments just as the human intercessions ruin the regular ecosystem. The mucky nature of the soil is undergoing some transformative processes. The fundamentally imperiled trees called kulavetty (*syzygium travencuricum*) species which are nectar giving flowering plants to the lemon emigrants (Pieridae) and yellow pansy (*nymphalidae*) butterflies are also decreasing in its population . So it is advisable to conserve the Heritage region to maintain the Diversity . And also suggest to make the progressing development programme, such as the tourism- project, without disturbing the existing diversit

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