



# **Abundance, habitat preference and seasonal patterns of different butterfly species (Order: Lepidoptera): A preliminary study in West Bengal State University (WBSU) campus, West Bengal, India**

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## **Abstract**

A study conducted on the butterfly species of the West Bengal State University (WBSU), West Bengal between December 2021 to November 2022. A total of 74 butterfly species belonging to five families (Papilionidae, Lycaenidae, Hesperidae, Nymphalidae and Pieridae) were recorded from WBSU in study area. The special habitat is one of the first of its kind, providing a comprehensive perspectives on species diversity and abundance of butterfly species. The highest number of species followed by Family Nymphalidae, Lycaenidae, Hesperidae, Pieridae and Papilionidae. The abundance of this species stated of Common, Very Common, Rare, Very Rare and Not Rare. Butterfly species, donation essential ecosystem services, respond uniquely to urbanization and can be a good tool for better assess residence. The butterfly species used different types of habitat (Grass land, Open forest, scrub forest and herb forest) and among all, scrub forests were the most preferred habitat. Seasonal variation in the number of species was observed, which shows the highest number of species in Post monsoon session and the lowest during Winter session. This study aims to contribute to the development of biodiversity restoration plans and habitat management on our WBSU campus.

**Keywords:** Abundance, butterfly species, WBSU campus, habitat, seasonal variation, status

## **Introduction**

Butterfly species exhibit wide dispersal and distribution (Padhye et al, 2006; Ramesh et al, 2010) in the order Lepidoptera because of their evolutionary capacity to adapt themselves morphologically and physiologically to different

natural conditions. (Pollard 1991; Kunte 1997). Many butterfly species are strictly seasonal and prefer only one particular habitat (Kunte, 2008) and they are indicators in terms of demographic distribution and habitat quality (Kocher and Williams, 2000). Some butterfly species show changes in species composition in response to

selective logging (Hamer et al., 2003) that are unlikely to affect ungulates or carnivores to the same degree (Arya et al., 2014).

About 90% of all plants depend on pollination vectors and other pollinating agents continue pollination for their reproductive success (Kearns and Inouye, 1997). More than 155,000 species of Lepidoptera have been described to date (Nieukerken et al., 2011; Mallik et al., 2022), as this order comprises 10% of known animal diversity (Kristensen et al., 2007). Butterfly species (Papilionoidea) comprise five families: Papilionidae, Pieridae, Lycaenidae, Nymphalidae and Hesperiidae and together represent 13% of total species in Lepidoptera Worldwide (Kawahara and Breinholt 2014; Liorente et al., 2004). Number of Indian butterfly species up to one-fifth of the world's fauna (Kunte, 2000; Kumari et al., 2016). Butterfly diversity of a particular habitat (Padhye et al., 2006; Tiple, 2009). Indian hosts about 1,501 butterfly species of which peninsular India hosts 350 (Gaonkar.H., 1996; Tiple, 2009).

Several studies have shown that butterfly species are key taxa for biodiversity monitoring because they reflect changes of climatic conditions (Beaumont and Hughes, 2002; Fileccia et al., 2015) as well as seasonal and other ecological changes (Kunte, 1997; Lomov et al., 2006; Balleotto et al., 2010; Fileccia et al., 2015) and they are good indicators of anthropogenic disturbance and habitat quality (Bergman et al., 2008; Bonebrake et al., 2010; Fileccia et al., 2015). They are highly responsive to microclimate, temperature changes, Humidity, solar radiation and precipitation patterns (Sparrow et al., 1994; Thomas et al., 1998; Fordyce and Nice, 2002; Fordyce and Nice, 2003).

This combination costs to change the butterfly diversity in each session (Roy, 2003; Chandekar, 2014). The WBSU campus is known for maintain greenery the entire area, although most areas are civilized (Clarke, 1997). The WBSU campus has many feedback resources with dense vegetations, some large open spaces and water resources, etc (Dennis et al., 2006). These areas provide a wide

range of habitats for butterfly species on the WBSU campus (Rosenzweig., 1981; Barrow, 2008).

Exploring local abundance, community composition and seasonality of butterfly species is also important for two reasons. First, to understand the butterfly species community ecology (Naik et al., 2022) of a particular region and second, to obtain baseline data of this umbrella taxon (New, 1997) from an ecologically sensitive area in the context of climate change, habitat degradation/loss and conservation (Kim, 1993; Midgley et al., 2002). Such studies on community dynamics are useful in effective monitoring of environmental changes caused by anthropogenic activities such as deforestation, agricultural expansion and urbanization, etc (Gadgil, 1996; Purvis and Hector 2000; Clark, 2007; Giriraj et al., 2008).

Additionally, climate change and environmental change are both cause and effects, and the former have a disproportionately greater impact on environmentally sensitive areas (Niyogi et al., 2010). Butterfly species are sensitive to habitat changes so are important candidates for monitoring (Pearson 1994; Molleman et al., 2006). They are sensitive to floral diversity and vegetation structure (Brehm et al., 2003; Molleman et al., 2006). Structural factors in habitat and climate change (Parmesan et al., 1999) play an important role in the biodiversity of butterfly species (Hill et al., 2001; Molleman et al., 2006).

The main types of vegetation on the WBSU campus are dry evergreens and mainly members include scrubs and herbs Family: Poaceae, Fabaceae, Cyperaceae, Arecaceae, Zingiberaceae, Anonaceae, Papilionaceae, Rutaceae, Malvaceae, etc. Butterfly species behave like opportunistic animals (Courtney and Shapiro, 1986) and nectar collection, but their choice of flowers is not random, often they possess specific species likes flowers (Gutierrez et al., 1998).

Therefore, the current study was conducted to look at the diversity of butterfly species in terms of species richness and abundance associated with different habitat preference and seasons in the WBSU campus (Despland et al., 2012).

### Study site

The study site is located at West Bengal State University Campus(WBSU)(22.73'56" N and 88.43'26"E) and belongs to the suburban belt of North 24 Paraganas, Barasat, West Bengal, India. The campus is spread over an area of 27.86 acres with green vegetation of naturally growing large trees, shrubs and grasses that provide shelter to the butterfly species (Buckley, 1997). The good

source of nectar, food plants suitable for egg laying, open sunny space and reduced use of pesticides has resulted in varied species diversity of butterfly species in the study area (Rothschild, 1977; Kunte, 1999). Mean annual temperature of WBSU is slightly above 34°C. But in summer the average temperature occasionally goes often beyond 37°C. The annual average rainfall has been recorded about 1500 mm (Wickman, 1985). As the area belongs to the Monsoon climate, June to July is the rainiest season, September to November is post-monsoon season, while December to February is the winter Season and March to May is the hot summer season (Bisai et al 2014; Dey, 2016).



Image 1: Map of study area

### Methods

The findings presented here are based on random surveys carried out from December, 2021 to November, 2022. "Pollard walk" method (Pollard 1977; Pollard and Yates, 1993) was adopted with a few modifications based mainly on climate consideration (Majumder et al,2012; Sing,2010; Sing, 2012; Sundafu , 2008; Nidup, 2014). A fixed three transects of 150 m length walked twice a day with 5 m on either side covered in walking at a constant pace between 10 a.m. to 5 p.m. The samplings were done for resulted in a final count of 192 transects from study area (Dasgupta and Rao, 2014). Seasonality and abundance of butterfly species in different habitats (grass land, open forest, shrubs and herbs, etc) were also recorded (Bobo et al, 2006).

Identification of the butterfly species was primarily made directly in the field. Those species observed of the survey days were categorized as Very Common (VC), as Common (C), as Not Rare (NR), as Rare (R) and Very Rare (VR) (Nair et al, 2014). Species identify was confirmed with the help of the field guides Evans(1932), Kunte(2000) and Kehimkar(2008) (Evans.1932; Kunte.2000; Kehimkar.2008; Day and Ghosh.2016). All scientific names followed in the present study are in accordance with Varshney (1983) (Varshney.1983; Saha, 2017) and English names follow Wynter-Blyth (1957) (Wynter-Blyth.1957). Diversity indices were analyzed with the help of Microsoft Excle 2007 (Majumder et al., 2012; Trivedi et al. 2022) to understand the community structure of butterfly species in the study area (Mitra et al, 2018).

## Results

Seventy-four butterfly species belonging to five families (**Table 1**) were recorded from the WBSU campus during study period.

Table 1: Butterfly species of WBSU campus together with common name, flight period, habitat preference and status

Common Name	Scientific Name	Family	Status	Habitat Preference	Flight period
COMMON ROSE	<i>Pachliopta aristolochiae</i>	Papilionidae	C	OF	S,M,PM,W
BLUE MORMON	<i>Papilio polymnestor</i>	Papilionidae	VR	OF,SF	M,PM
COMMON MORMON	<i>Papiliopolytes Linnaeus</i>	Papilionidae	C	OF	S,M,PM,W
COMMON MIME	<i>Papilio clytia</i>	Papilionidae	C	OF,SF	M,PM
COMMON JAY	<i>Graphium doson</i>	Papilionidae	VC	OF,SF	S,M,PM
TAILED JAY	<i>Graphium agamemnon</i>	Papilionidae	C	OF	S,PM,W
LIME BUTTERFLY	<i>Papiliodemoleus</i>	Papilionidae	VC	SF	S,M,PM,W
COMMON BLUEBOTTLE	<i>Graphium sarpedon</i>	Papilionidae	VR	SF	M
PSYCHE	<i>Leptosia nina</i>	Pieridae	C	OF,SF	S,PM,W
COMMON GRASS YELLOW	<i>Eurema hecabe</i>	Pieridae	C	GL,OF,SF	S,M,PM
THREE-SPOT GRASS YELLOW	<i>Eurema blanda</i>	Pieridae	C	GL,OF,SF	PM
COMMON JEZEBEL	<i>Delias eucharis</i>	Pieridae	C	OF,SF	S,PM,W
EASTERN STRIPPED ALBATROSS	<i>Appias libythea</i>	Pieridae	C	GL,OF,SF	S,M,PM,W
COMMON GULL	<i>Cepora nerissa</i>	Pieridae	C	GL,OF,SF	M,PM
LEMON EMIGRANT	<i>Catopsilia pomona</i>	Pieridae	C	OP, Mp	S,M,PM,W
MOTTLED EMIGRANT	<i>Catopsilia pyranthe</i>	Pieridae	VC	GL,SF	S,M,PM,W
COMMON WANDERER	<i>Pareronia valeria</i>	Pieridae	C	SF	PM
COMMON ALBATROSS	<i>Appias albina</i>	Pieridae	VR	SF,Mp	M,PM
QUAKER	<i>Neopithecops zalmora</i>	Lycaenidae	VC	OP, MP	S,M,PM,W
PALE GRASS BLUE	<i>Pseudozizeeria maha</i>	Lycaenidae	C	GL,OF	S,M,PM,W
DARK GRASS BLUE	<i>Zizeeria karsandra</i>	Lycaenidae	C	GL,SF	PM,W
LIME BLUE	<i>Chilades laius</i>	Lycaenidae	C	GL,SF	S,M,PM,W
PLAINS CUPID	<i>Chilades pandava</i>	Lycaenidae	C	GL,SF	M,PM,W

GRAM BLUE	<i>Euchrysops cnejus</i>	Lycaenidae	C	GL,SF	S,M,PM
FORGET-ME-NOT	<i>Catochrysops strabo</i>	Lycaenidae	C	GL, MP	PM
COMMON SILVERLINE	<i>Cigaritis vulcanus</i>	Lycaenidae	VC	SF	S,M,PM
TAILLESS LINEBLUE	<i>Prosotas dubiosa</i>	Lycaenidae	R	GL,SF	S
ZEBRA BLUE	<i>Leptotes plinius</i>	Lycaenidae	C	GL,SF	M
COMMON PIERROT	<i>Castalius rosimon</i>	Lycaenidae	C	GL,SF	S,M,PM,W
ROUNDED PIERROT	<i>Tarucus extricatus</i>	Lycaenidae	C	GL,SF	M,PM
MONKEY PUZZLE	<i>Rathinda amor</i>	Lycaenidae	NR	OF	M
SLATE FLASH	<i>Rapala manea</i>	Lycaenidae	C	SF	M,PM
TINY GRASS BLUE	<i>Zizula hylax</i>	Lycaenidae	VC	GL,SF	M,PM
YAMFLY	<i>Loxura atymnus</i>	Lycaenidae	C	GL, MP	PM
APEFLY	<i>Spalgis epius</i>	Lycaenidae	VR	SF	M
SMALL CUPID	<i>Chilades parrhasius</i>	Lycaenidae	C	GL,SF	PM
FALCATE OAKBLUE	<i>Mahathala ameria</i>	Lycaenidae	VR	SF	M,PM
GRAY PANSY	<i>Junonia atlites</i>	Nymphalidae	VC	OF	S,M,PM,W
PEACOCK PANSY	<i>Junonia almana</i>	Nymphalidae	VC	OF	S,M,PM,W
LEMON PANSY	<i>Junonia lemonias</i>	Nymphalidae	VC	OF	M,PM
COMMON PALMFLY	<i>Elymnia shypermnestra</i>	Nymphalidae	VC	OF	S,M,PM
COMMON CASTOR	<i>Ariadne merione</i>	Nymphalidae	C	OF	S,PM,W
ANGLED CASTOR	<i>Ariadne ariadne</i>	Nymphalidae	C	OF	PM,W
TAWNY CASTOR	<i>Acraea violae</i>	Nymphalidae	C	OF	S,M,PM
COMMON EVENING BROWN	<i>Melanitis leda</i>	Nymphalidae	VC	GL	M,PM
COMMON BUSHBROWN	<i>Mycalesis perseus</i>	Nymphalidae	VC	OF, Mp	PM
DARK BRANDED BUSHBROWN	<i>Mycalesis mineus</i>	Nymphalidae	C	GL, Mp	PM
COMMON CROW	<i>Euploea core</i>	Nymphalidae	VC	OF, MP	S,PM,M
COMMON FOUR RING	<i>Ypthima huebneri</i>	Nymphalidae	VC	OF	S,M,PM

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COMMON FIVERING	<i>Ypthima baldus</i>	Nymphalidae	C	OF	M,PM
COMMON LEOPARD	<i>Spotted rustic</i>	Nymphalidae	C	OF	PM
COMMANDER	<i>Moduza procris</i>	Nymphalidae	C	OF,SF	PM
GREAT EGGFLY	<i>Hypolimnas bolina</i>	Nymphalidae	C	GL	M,PM
CHEASTNUT STREAKED SAILOR	<i>Neptis jumbah</i>	Nymphalidae	C	OF,SF	PM,W
GUDDY BARON	<i>Euthalia lubentina</i>	Nymphalidae	C	SF	PM
COMMON BARON	<i>Euthalia aconthea</i>	Nymphalidae	C	GL	PM
PLAIN TIGER	<i>Danaus chrysippus</i>	Nymphalidae	C	GL	S,PM,W
STRIPED TIGER	<i>Danaus genutia</i>	Nymphalidae	C	GL	S,PM,W
BLUE TIGER	<i>Tirumala limniace</i>	Nymphalidae	C	GL	M,PM
PAINTED LADY	<i>Vanessa cardui</i>	Nymphalidae	C	SF	PM
DANADID EGGFLY	<i>Hypolimnas misippus</i>	Nymphalidae	C	SF	PM
COMMON BANDED AWL	<i>Hasora chromus</i>	Hesperiidae	C	OF	M,PM
INDIAN SKIPPER	<i>Spialia galba</i>	Hesperiidae	C	OF,SF	M,PM
GRASS DEMON	<i>Udaspes folus</i>	Hesperiidae	C	GL,SF	S,M,PM
INDIAN PALM BOB	<i>Suastus gremius</i>	Hesperiidae	C	SF	M,PM
SMALL - BRANDED SWIFT	<i>Pelopidas mathias</i>	Hesperiidae	VC	SF	M,PM
RICE SWIFT	<i>Borbo cinnara</i>	Hesperiidae	VC	SF,OF	M,PM
STRAIGHT SWIFT	<i>Parnara guttata</i>	Hesperiidae	C	SF	M,PM
PARNARA CONTINENTAL SWIFT	<i>Parnara ganga</i>	Hesperiidae	C	SF	PM
COMMON BUSH HOPPER	<i>Ampittia dioscorides</i>	Hesperiidae	NR	GL,OF	M
COMMON REDEYE	<i>Matapa aria</i>	Hesperiidae	C	OF,SF	PM
COMMON PLAM DART	<i>Telicota colon</i>	Hesperiidae	NR	GL,SF,OF	PM
CHESNUT BOB	<i>Iambrix salsala</i>	Hesperiidae	C	GL,OF,SF	M,PM
COMMON SNOW FLAT	<i>Tagiades japetus</i>	Hesperiidae	NR	OF,SF	PM

\*\* Marked butterfly species are recorded from the study area; # Very Common (VC), as Common (C), as Not Rare (NR), as Rare (R) and Very Rare (VR), ## Summer (S), Monsoon (M), Post Monsoon (PM), Winter (W), ### All Habitat (AH), Grass Land (GL), Open Forest (OF), Scrub Forest (SF), Mud Puddles (MP).

The highest number of species of Family Nymphalidae (24 species, 32%), Family Lycaenidae (19 species, 26%), Family Hesperidae (13 species, 18%), Family Pieridae (10 species 13%) and the lowest number of species of Family Papilionidae (8 species, 11%) of the recorded species (**Fig 1**). Among these species, 48 (65%) were Common, 16 (22%) were Very Common, 1(1%) was Rare, 5 (7%) were Very Rare and 4(5%) were Not Rare (**Fig 2**).

The WBSU campus is greenery area connecting comprises grassland, open forest and scrub forest. Hence, butterfly species get opportunities to use different types of habitat in the WBSU campus (**Fig 2 & 3**). Fifty-nine of 74 butterfly species preferred multiple habitats. Forty-eight species favored two types and fifty species were observed only in a single habitat. Mud paddling was observed in eight species (**Fig 3**).

The number of species were varying the year representing the season (monsoon)-wise distribution of butterfly species (**Fig 4**). Highest number of species were recorded during Post monsoon season(n=65) (September to November) followed by Monsoon season (n=43) (June to August), Summer (n=24) (March to May) respectively while, the least number of species were recorded in the Winter season (n=20) (December to February). The family-wise abundance of species (**Fig 5**) was highest during post monsoon season for the family Nymphalidae (n=24), family Lycaenidae (n=15), family Hesperidae (n=12), family Pieridae (n=9) and family Papilionidae (n=5). The overall abundance was highest during post monsoon session (n=65) and the lowest during winter session (n=20)

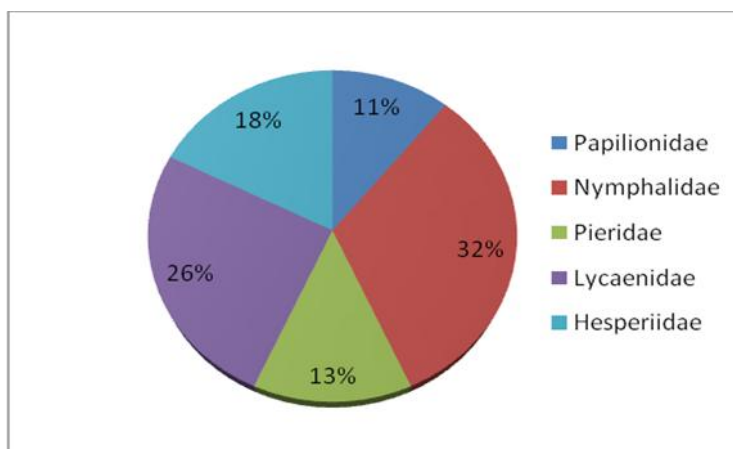


Fig 1: Family-wise of butterfly species at WBSU campus

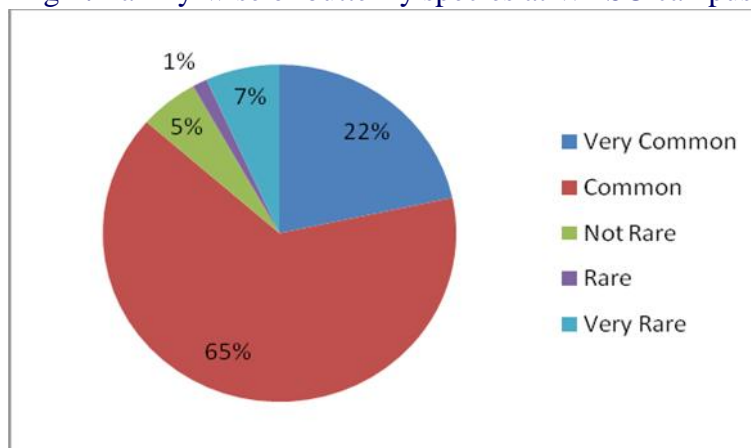


Fig 2: Status abundance of butterfly species at WBSU campus

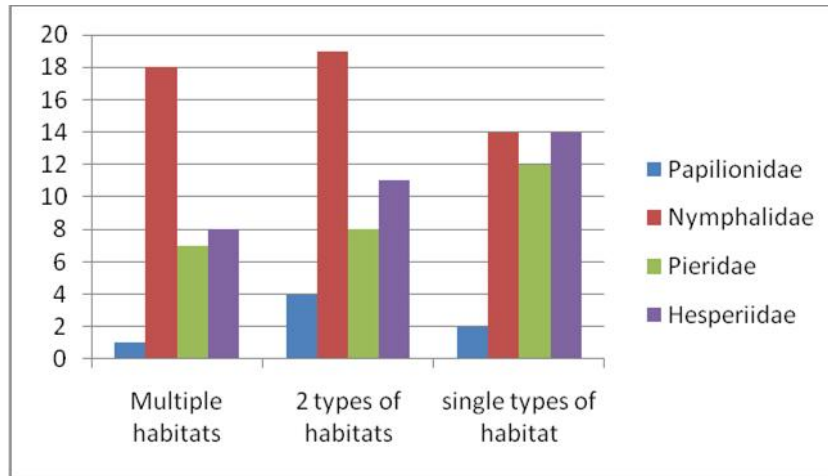


Fig 3: Types of habitat preferred by different butterfly families

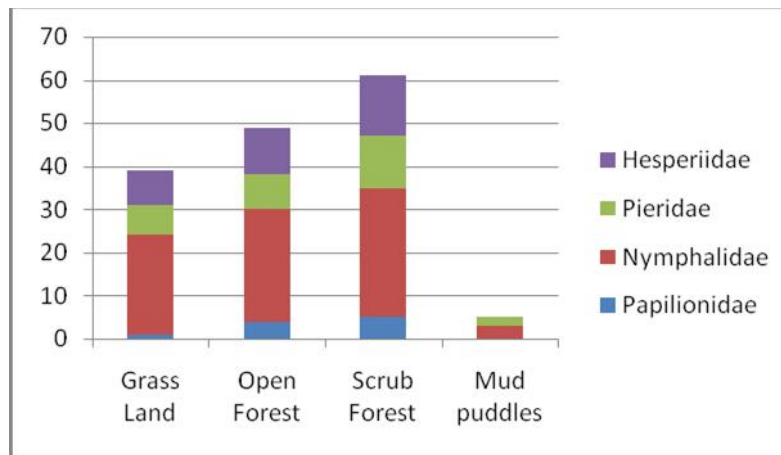


Fig 4: Number of habitat preferred by different butterfly families

Table 2: Relative abundance of butterfly species in WBSU campus

Sl. No.	Family	Very common	Common	Not rare	Very rare	Rare	Number of species
1	Papilionidae	2	4	0	2	0	8
2	Nymphalidae	8	16	0	0	0	24
3	Pieridae	1	8	0	1	0	10
4	Lycaenidae	3	12	1	2	1	19
5	Hesperidae	2	8	3	0	0	13
	Total	16	48	4	5	1	74



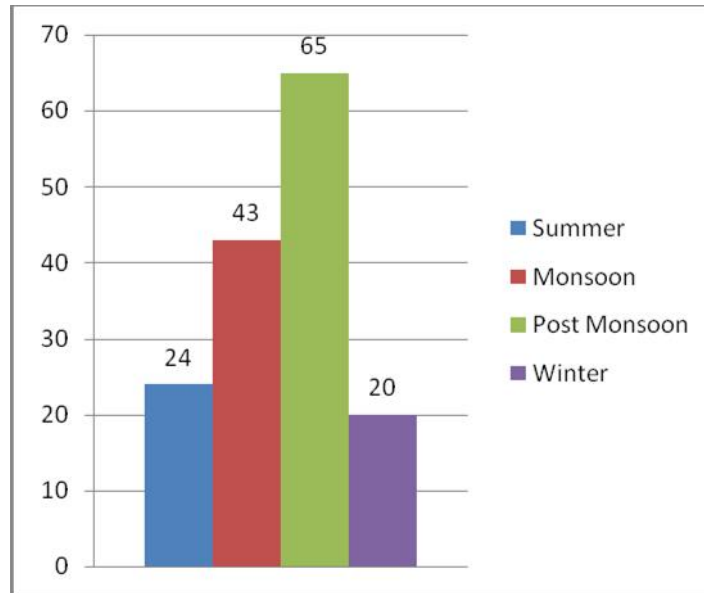


Fig 4: Seasonal Variation of butterfly species

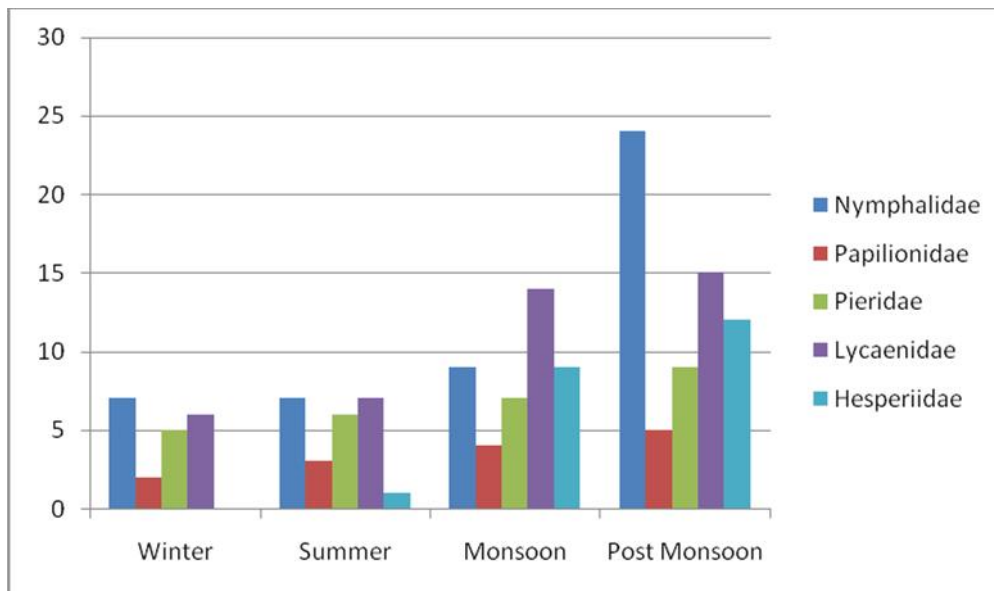


Fig 5: Seasonal Variation of butterfly species of different families

Table 3: Family-wise composition of butterfly community in the study area

Season	Nymphalidae	Papilionidae	Pieridae	Lycaenidae	Hesperidae
Winter	7	2	5	6	0
Summer	7	3	6	7	1
Monsoon	9	4	7	14	9
Post Monsoon	24	5	9	15	12

## Discussion

A total of 1,535 individuals from 74 species representing all five families of butterfly species were counted and recorded in the study area (Smith et al. 2016). Seasonal distribution shows that Nymphalidae are dominant family with the highest number of species in all season. The dominance of Nymphalidae belongs to them polyphagous in nature, food plants are available and also aids in search due to their strong, active flying habits strong, active flying habits, different food resources. Availability of larval host plants and nectar plants may be a factor in its dominance (Murugesan et al., 2013). The number of species were varying the year representing the season (monsoon)-wise distribution of butterfly species. Highest number of species were recorded during Post monsoon season followed by Monsoon season, Summer respectively while, the least number of species were recorded in the Winter season (Tiple and Khurad., 2009). The family-wise abundance of species was highest during post monsoon season for the family Nymphalidae, family Lycaenidae, family Hesperidae, family Pieridae and family Papilionidae. The overall abundance was highest during post monsoon session and the lowest during winter session.

The butterfly species preference for particular habitats is associated with this availability of larval host plants and nectar plants (Raju and Reddy, 1995). Rich diversity of butterfly species, especially Nymphalids and Lycaenids in WBSU campus indicates a diverse assemblage of floral species. The flora in our campus a mixed type with grass land, open forest, herbs and shrubs the environment. The study area is dominated by plant species belonging to families Poaceae, Fabaceae, Cyperaceae, Arecaceae, Zingiberaceae, Anonaceae, Papilionaceae, Rutaceae, Malvaceae, etc. namely *Cassia sp*, *Sida sp*, *Ficus sp*, *Tridax sp*, *Ixora sp*, *Citrus sp*, *Lantana sp*, *Psidium sp*, *Cleome sp*, *Magnifera indica*, *Hibiscus sp*, *Saccharum sp*, *Cynodon sp*, *Panicum sp*, *Sorghum sp*, *Areca sp*, *Calamus sp*, *Annona sp*, *Polyalthia sp*, *Cleome sp*, *Cesalpiniasp*, *Oxalis sp*, *Glycomis sp*, *Urena sp*, *Clerodendrum sp*, *Acmella sp*,

*Aerva sp*, *Mikania sp*, *Barleria sp*, *Gardenia sp*, *Glycosmis sp*, *Cosmos sp*, *Zizyphus sp* and grasses which provide diverse habitat and food sources for butterfly species. The study area which higher diversity have vegetation and abundant flowering plants and trees which provide very favorable habitat to the butterfly species. Their larvae can easily find the host plants and the vegetation provide excellent shelter to the butterfly species, particularly during the summer seasons (Laxmi and Raju, 2011).

From our present study highest number of butterfly species found from family Nymphalidae 24 species followed by Lycaenidae 19 species, Hesperidae 13 species, Pieridae 10 species, Papilionidae 8 species. From the Nymphalidae family the butterfly species found in this study are *Junonia atlites*, *Junonia almana*, *Junonia lemonias*, *Vanessa cardui*, *Euthelialubentina*, *Euthelia aconthea*, *Spotted rustic*, *Hypolimnas bolina*, *Moduza procris*, *Mycalesis perseus*, *Danaus chrysippus*, *Danaus genutia*, *Tirumala limniace*, *Ariadne merione*, *Acraea violae*, *Ariadne ariadne*, *Euploea core*, *Melanitis leda*, *Elymnias hypermnestra*, *Ypthima huebneri*, *Ypthima baldus*, *Mycalesis mineus*, *Neptis jumbah*; from the family Lycaenidae butterfly species found in this recent study are *Neopithecops zalmora*, *Euchrysops cnejus*, *Catochrysops Strabo*, *Prosotas dubiosa*, *Leptotes plinius*, *Zizeeria karsandra*, *Pseudozizeeria maha*, *Mahathala ameria*, *Loxura atymnus*, *Chilades lajus*, *Chilades pandava*, *Castalius rosimon*, *Spalgis epius*, *Spindasis vulcanus*, *Rapala manea*, *Prosotas nora*, *Rathinda amor*, *Chilades parrhasius*, *Zizula hylax*; from the family Papilionidae butterfly species that found in this recent study are *Papilio polytes*, *Papilio polymnestor*, *Papilio clytia*, *Graphium sarpedon*, *Graphium doson*, *Graphium agamemnon*, *Papilio demoleus*, *Pachliopta aristolochiae*; from the family Pieridae butterfly species that found in this recent study are *Leptosis nina*, *Eurema blanda*, *Eurema hecabe*, *Appias libythea*, *Catopsilia pomona*, *Catopsilia pyranthe*, *Delias eucharis*, *Cepora nerissa*, *Appias albino*, *Pareronia valeria*; from the family Hesperidae

butterfly species found in this recent study are *Parnara guttatus*, *Pelopidas mathias*, *Iambrix salsala*, *Borbo cinnara*, *Telicota colon*, *Hasorac hromus*, *Spialia galba*, *Udaspes folus*, *Panara ganga*, *Tagiades gana*, *Matapa aria*, *Ampittia dioscorides*, *Suastus gremius* (Table No. 1).

Status Abundance of butterflies from this study recognized are Very common (22%) species, Common species (65%), Not rare species (5%), Rare species (1%), Vary rare species (7%). For the common, very common and not rare species the environment, food supply, breeding places of Study area is mostly friendly. More than 64 species of butterfly recognized in dominant highest numbers in this study area. The most dominant butterfly species of this study area are *Ypthima huebneri*, *Euploea core*, *Junonia iphita*, *Eurema hecabe*, *Leptosia nina*, *Danaus chrysippus*, *Chilades pandava*, *Mycalesis perseus*, *Rapaia manea* etc. From our present study one butterfly species designated as rare species in this study area i.e. Tailless Lineblue (*Prosotas dubiosa*) from the family Lycaenidae and five butterfly species are designated as Very rare; Ape fly (*Spalgis epius*) from the family Lycaenidae, Falcate Oakblue (*Mahathala ameria*) from the family Lycaenidae, Blue Mormon (*Papilio polymnestor*) from the family papilionidae, Common Bluebottle (*Graphium sarpedon*) from the family papilionidae and Common albatross (*Appias albino*) from the family pieridae. These species needs to be conserved so that they do not go extinct. Nowadays urbanization has increased a lot, garbage dumping, habitat loss, pollution, deforestation have increased to a high extent. Because of that the butterfly species population is affected. In our daily life we can implant samplings, keep urban places, University garden clean so that at least the present levels of butterfly diversity and abundance can be maintained.

## Conclusions

Within the study area of WBSU, 74 species belonging to five families were recorded. The study range supports a rich diversity of butterfly

species due to the variety of vegetation that provides them an ideal breeding habitat. This study tries to show the importance of local area as a model geographical regions, with different habitats, suggest the importance of the local populations over the long term study and conservation of biodiversity. Butterfly species are sensitive to landscape change, vegetation formation and habitat loss decaying urbanization threatens butterfly diversity along with deteriorating environmental conditions. This study can generate interest among students and local citizens and promote conservation efforts to establish butterfly species friendly plantations with the help of local authorities. Preliminary results on butterfly species have been published the present study is expected to provide the necessary savings can be planned for appropriate and directions university for future research opportunities.

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## Statement of conflict of interest

The authors declare no conflict interest.

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