GOVT. HOLKAR (MODEL AUTONOMOUS) SCIENCE COLLEGE, INDORE

(An ISO 9001:2015 & ISO 14001:2015 Certified Instituion)

SSR DOCUMENT

2017-18 to 2021-22

CRITERION –7

Institutional Values and Best Practices

Metric No. : 7.2.1

SURESH T SILAWAT

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Document Title:

A. Ecological Conservation Park

V. Evidence of Success

तमसो मा ज्योतिर्गमय

a. Organic Compost prepared & Used In-house
b. Enhanced Bird Activity
c. Research Publications/Popular Articles
d. Documentary & National Awards

Content

BIRD SURVEY

GOVERNMENT HOLKAR SCIENCE COLLEGE

INDORE (M.P.)

22 MAY 2022

A SURVEY REPORT

BY

Wild Warriors

&

GOVERNMENT HOLKAR SCIENCE COLLEGE

ABOUT GOVERNMENT HOLKAR SCIENCE COLLEGE

Govt.(Model, Autonomous) Holkar Science college, Indore was established by, the then King of erstwhile Holkar state, Hon'ble Maharaja Shivaji Rao Holkar, in June 1891. The visionary king selected Mr. Cholmondeley from UK as its first principal. The college started with the best talent available in teaching in India and abroad. At the time of opening of the new building of the college, the manager of the state stressed the need of girls' education. The king could foresee that conservatism and dogmatic religious beliefs would soon give way to scientific outlook and rationalism. With the increasing number of students and multiplication of disciplines, the college was split into two separate and independent units. One of these two colleges was designated as Govt. Arts and Commerce College while this college retained its prestigious original name i.e. Holkar College and continued to be housed in the old college building.

Ever since its inception the institution has striven hard to fulfill its promises of providing quality education to produce thoughtful, intelligent and competent human beings, capable of facing the challenges of the life bravely. The alumni of the college has occupied prestigious positions in almost every walk of life. Perhaps this is the only college which produced Chief Justice of Supreme Court of India, Hon'ble Justice R.C.Lahoti and Chief Justice of Pakistan Hon'ble Justice Alvin "Bobby" Robert Cornelius.The father of Justice Cornelius was a faculty member of the college. At present, the institution is imparting education in science with the emphasis on scientific research. The college has the privilege to be visited by VVIPs like Pt. Jawaharlal Nehru (First Prime Minister of Independent India),Dr.S. Radhakrishnan, Dr.A.P.J.Abdul Kalam (Former President of India),Dr. Shankar Dayal Sharma (Former Vice President of India), Shri L.K.Advani(Former Home Minister of India) and almost all the Chief Ministers of Madhya Pradesh.Besides these dignitaries, the college also witnessed the presence of Shri Prithviraj Kapoor (Actor), Shri Hemant Kumar (Singer), Shri Anil Biswas (Music Director), Pt.Madan Mohan Malviya (Indian educationist), Shri Shard Joshi (Poet), Mrs. Malti Joshi (Literature) etc. to name a few.

ACKNOWLEDGEMENT

DR SURESH T SILAWAT

PRINCIPAL

GOVT. HOLKAR SCIENCE COLLEGE, INDORE

WE WOULD LIKE TO EXTEND OUR SPECIAL THANKS TO DR SURESH SILAWAT PRINCIPAL FOR THIS WONDERFUL INITIATIVE TO INVOLVE STUDENTS IN SUCH A UNIQUE ACTIVITY WHICH NOT ONLY HELPS IN IDENTIFICATION OF FLORA & FAUNA OF THE AREA BUT ALSO BRING THEM CLOSE TO NATURE. HIS SCINECER EFFORTS IN PROMOTING NATURE RELATED ACTIVITIES IS HIGHLY APPRESIABLE.

DR SANJAY VYAS

HOD-BOTANY, SEED TECHNOLOGY & HORTICULTURE

WE ARE THANKFUL TO DR SANJAY VYAS FOR HELPING IN SMOOTH EXECUTION OF THE SURVEY. HIS IMMENSE SUPPORT AND PRESENCE DURING THE SURVEY MOTIVATED THE SURVEY TEAM.

MANAGING TEAM WILD WARRIORS

SHRI RITESH KHABIA WILD WARRIORS

SHRI SACHIN MATKAR WILD WARRIORS

SHRI KAMLESH NACHAN WILD WARRIORS

SHRI ANSHUMAN SHARMA WILD WARRIORS

SHRI SWAPNIL PHANSE WILD WARRIORS

OBJECTIVE

BIRD SURVEY

- To introduce Birds and Birding to the students of Govt. Holkar Science College.
- To inculcate love for nature amongst the students.
- To document the bird species available at Govt. Holkar Science College Campus.
- To spread awareness amongst the students and staff of Govt. Holkar Science College about birds and nature.
- To draw up a base data of birds species available.
- To record the bird diversity on eBird, so that the compiled data is easily accessible to students, academicians, nature volunteers researchers scientists seamlessly.
- To make future strategies as how to increase the green cover of college to get biodiversity rich

METHODOLOGY & PROTOCOL USED

BIRD SUREY

- A total of 2 different birding routes/trails were identified on which the 02 teams travelled on foot and documented the different species of bird that came across.

- Each team constituted of 12 members and every team was expected to be in the field for minimum 1.30 hrs. The team walked an approximate distance of 2-3 kms. The walk started at 6.30 hrs.

- During the survey, the list of birds is made on eBird All the eBird checklists were uploaded on the eBird site and shared with one common group account named online.

- The team's task was to record as many species as possible, but it was more important to record correct identity of the bird.

- Birders were also encouraged to record bird calls, as some of the times it is very helpful in identifying a bird species. The team leaders had the responsibility to submit the completed checklists on eBird.

- To record the bird diversity on eBird, so that the compiled data is easily accessible to students, academicians, nature volunteers researchers scientists & researchers seamlessly.

BIRD SPECIES DOCUMENTED

S.NO	SPECIES	SCIENTIFIC NAME
1	LITTLE SWIFT (INDIAN HOUSE SWIFT)	APUS AFFINIS
2	INDIAN POND-HERON	ARDEOLA GRAYII
3	PURPLE SUNBIRD	CINNYRIS ASIATICUS
4	ROCK PIGEON (BLUE ROCK PIGEON)	COLUMBA LIVIA
5	LAUGHING DOVE (LITTLE BROWN DOVE)	STREPTOPELIA SENEGALENSIS
6	GREATER COUCAL	CENTROPUS SINENSIS
7	ASIAN KOEL	EUDYNAMYS SCOLOPACEUS
8	WHITE-BREASTED WATERHEN	AMAURORNIS PHOENICURUS
9	RED-WATTLED LAPWING	VANELLUS INDICUS
10	LITTLE EGRET	EGRETTA GARZETTA
11	SHIKRA	ACCIPITER BADIUS
12	BLACK KITE	MILVUS MIGRANS
13	INDIAN GREY HORNBILL	OCYCEROS BIROSTRIS
14	COPPERSMITH BARBET	PSILOPOGON HAEMACEPHALUS
15	ROSE-RINGED PARAKEET	PSITTACULA KRAMERI
16	BLACK DRONGO	DICRURUS MACROCERCUS
17	RUFOUS TREEPIE	DENDROCITTA VAGABUNDA
18	COMMON TAILORBIRD	ORTHOTOMUS SUTORIUS
19	ASHY PRINIA	PRINIA SOCIALIS
20	RED-VENTED BULBUL	PYCNONOTUS CAFER
21	JUNGLE BABBLER	ARGYA STRIATA
22	BRAHMINY STARLING	STURNIA PAGODARUM
23	COMMON MYNA	ACRIDOTHERES TRISTIS
24	PURPLE-RUMPED SUNBIRD	LEPTOCOMA ZEYLONICA

TEAM MEMBMERS

S.NO	STUDENT'S NAME
1	MR ANIMESH SHARMA
2	MR RANA PRATAP PATHAK
3	MR SOURABH PATIDAR
4	MR MOHIT PATIDAR
5	MS NEHASHWARI TIWARI
6	MR RAJ KUMAR SOUR
7	MR RAHUL PARIHAR
8	MS BHAVNA JAGTAP
9	MR YOGESH BHURIYA
10	MR MAHENDRA MANDLOI
11	MR ANKIT YADAV
12	MR SATRUDHAN PATEL
13	MR DHEERAJ MALVIYA
14	MR HRITIK BAGRI
15	MR RAVINDRA SISODIYA
16	MS PRAGYA MASOORKAR
17	MS DIVYA SING THAKUR
18	MR NIKHIL CHAUHAN
19	MS NEELAM PANDAY
20	MR ANKIT BHALSE
21	MR RAMKARISHN KACHWARE
22	MR HARSHVARDHAN
23	MS ANJALI

S.NO	PROFESSOR'S NAME
1	SHRI DHARMENDRA JAT
2	SHRI GOVIND JAT
3	SHRI LOV ASATI

S.NO	TEAM WILD WARRIORS
1	MR SACHIN MATKAR
2	MR RITESH KHABIA
3	MR ANSHUMAN SHARMA
4	MR KAMLESH NACHAN
5	MR SHRIKANT KALAMKAR
6	MR SWAPNIL PHANSE

TEAM


INTERNATIONAL DAY FOR BIOLOGICAL DIVERSITY
BIRD SURVEY


(Re accredited "A" Grade by NAAC)
Govt. Holkar (Model, Autonomous) Science College, Indore

SURVEY AT A GLANCE

- PROF DHARMEDRA JAT INTRODUCED ALL THE STUDENTS ABOUT THE ACTIVITY TO BE DONE AND PURPOSE OF THE ACTIVITY.
- SHRI SACHIN MATKAR EXPLAINED ABOUT THE METHODOLOGY OF THE SURVEY AND PROTOCOLS TO FOLLOW.
- SURVEY STARTED AT 6.30 AM AND ENDED AT 8.00 AM AND COVERED ENTIRE CAMPUS OF GOVT. HOLKAR SCIENCE COLLEGE.
- POST SURVEY HOD DR SANJAY VYAS GREETED ALL THE STUDENTS AND TEAM WILD WARRIORS FOR THIS INITIATIVE AND TOLD THE PURPOSE OF THE ACTIVITY AND MOTIVATED STUDENTS TO COME CLOSE TO NATURE.
- STUDENTS SHARED THERE EXPERIENCE FOLLOWED BY BREAKFAST AND CONCLUSION OF THE SURVEY.

FLYING JEWELS

WHITE-THROATED KINGFISHER

ASIAN OPENBILL

SPOTTED OWLET

BLACK RUMPED WOODPACKER

LONG TAILED SHRIKE

ORIENTAL MAGPIE ROBIN

ASHY PRINIA

BLACK RED START

BRONZE WINGED JACANA

BLACK DRONGO

PIED KINGFISHER

INDIAN GREY HORNBILL

GOLDEN ORIOLE

GREEN BEE EATER

BLACK WINGED STILT

FLYING JEWELS

COMMON KESTREL

CRESTED SERPENT EAGLE

GREATER COUCAL

COPPERSMITH BARBET

PLUM HEADED PARAKEET

COMMON IORA

INDIAN SILVER BILL

SHIKRA

RIVER TERN

WHITE-EYED BUZZARD

WHITE BREASTED WATERHEN

BAYBACKED SHRIKE

LITTLE RINGED PLOVER

LESSER WHISTLING DUCK

INDIAN WHITE-EYE

Photo Courtesy: Mr Ritesh Khabia

THANK YOU

Govt. Holkar Science College, Indore (MP)

Wild Warriors Society Indore

Wild Warriors Society - 59/4 Vallabh Nagar, Indore (9575300232)
email: wildwarriorsindore@gmail.com

GOVT. HOLKAR (MODEL AUTONOMOUS) SCIENCE COLLEGE, INDORE
AND
KAMLA NEHRU ZOO,
Municipal Corporation, Indore

Organized

One Day Workshop

On

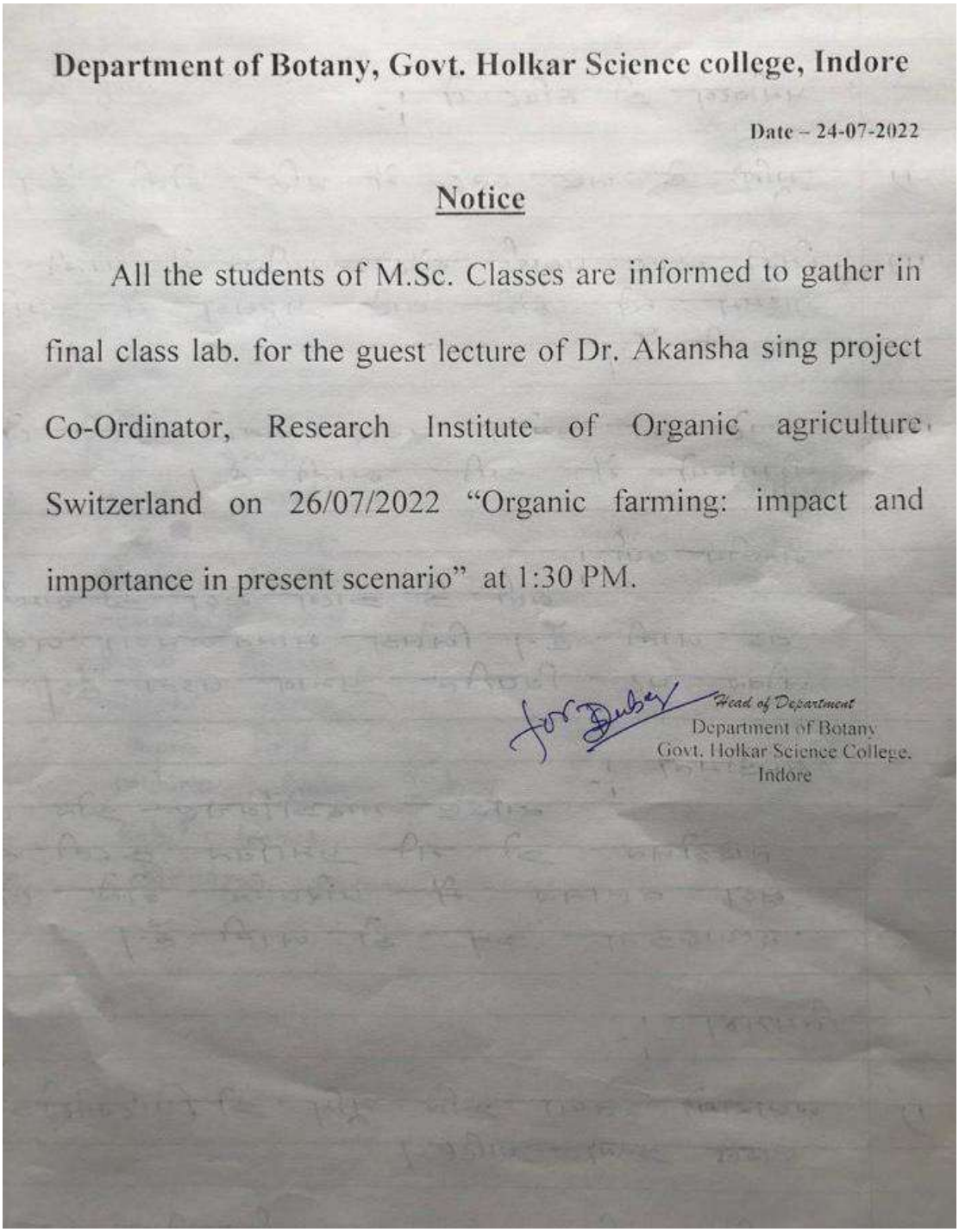
"Conservation & Management of Wild Life"

Date: 26/Sep/2022

Inaugurated by Shri Pushyamitra Ji Bhargava, Mayor, Indore Municipal Corporation, Indore.

Convenor	Co-Convenor	Incharge Zoo	Principal
Dr. Sanjay Vyas, Professor & Head, Dept. of Microbiology & Botany, Govt. Holkar Science College, Indore	Dr. Smita Dubey, Professor, Dept. of Botany, Govt. Holkar Science College, Indore	Dr. Uttam Yadav, Kamla Nehru Zoo, Indore	Dr. Suresh T. Silawat, Govt. Holkar Science College, Indore

Dr. Akansha singh, Project Co-ordinator, India FiBL, Switzerland



Department of Botany, Govt. Holkar Science college, Indore

Date – 24-07-2022

Notice

All the students of M.Sc. Classes are informed to gather in final class lab. for the guest lecture of Dr. Akansha sing project Co-Ordinator, Research Institute of Organic agriculture Switzerland on 26/07/2022 "Organic farming: impact and importance in present scenario" at 1:30 PM.

Head of Department
Department of Botany
Govt. Holkar Science College,
Indore

M.Sc II Sem Date - 26/07/22

1. Pooja kanojiya
2. Simran Thawani
3. Pragati Patidar
4. Sneha Trivedi
5. Pooja Pawar
6. Radhika Gadriya
7. Priti Baddle
8. Sunita Bandod
9. Rakesh Bamniya
10. Rajendra Damar
11. Praveen Keshari
12. Kapil Dangi
13. Kajal gawad
14. Vinita Bariya
15. Sheetal Kanesh
16. Manisha Munsel
17. Rupali Patidar
18. Ayushi Tomar
19. Sapna Patel
20. Mahima ~~Dawar~~ Dubey
21. Kapil Kanesh
22. Jitendra verma

Pooja
Pravesh
Pragati
Sneha
Rakesh
Rajendra
Priti
Sunita
Praveen
Kapil
Kajal
Vinita
Sheetal
Manisha
Rupali
Ayushi
Sapna
Mahima
Kapil
Jitendra


Department
of
BOTANY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THE DIVERSITY OF BUTTERFLIES AND THEIR LARVAL-HOST PLANT DISTRIBUTION AT GOVERNMENT HOLKAR SCIENCE COLLEGE, INDORE

Harsh Vishwakarma[1*], Grishma Trivedi[2], Sneha Nair[3], Kratika Patidar[4], V.K. Sharma[5], Rekha Sharma[6]

[1]PG Research Scholar, Department of Biotechnology, Government Holkar Science College, Indore, India
[2,3,4]PhD. Research Scholar, Department of Zoology, Government Holkar Science College, Indore, India
[5,6]Professor, Department of Zoology, Government Holkar Science College, Indore, India

Abstract: An investigation has been carried out to determine the diversity of butterflies and the distribution of their Larval-host Plants over a period of 9 months from October 2021 to June 2022, at the campus and surrounding area of Government Holkar Science College, Indore (GHSC). The study area Government Holkar Science College campus could be regarded as a biodiversity hotspot since it serves suitable habitats and favorable environmental conditions to a wide range of fauna by holding a diverse variety of flora. The GHSC campus consists of 14 gardens, 2 open grounds, and one botanical park, which are enriched with various herbs, shrubs, and trees. The present study has recorded 68 species of butterflies from 5 families which are Nymphalidae (22), Lycaenidae (21), Pierdiae (15), Hesperiidae (6), and Papilionidae (5). Out of the 68 species of butterflies, the butterfly species Angled Pierrot (*Caleta decidia*), Common Red Flash (*Rapala airbus*), and Indian Grizzled Skipper (*Spialia galba*), are the first reporting of distribution from The Indore district. 30 Larval-host plants of 19 floral families were also recorded on the GHSC campus namely, Acanthaceae, Anacardiaceae, Annonaceae, Apocynaceae, Bombacaceae, Capparaceae, Combretaceae, Crassulaceae, Cycadaceae, Euphorbiaceae, Fabaceae, Loranthaceae, Moraceae, Oxalidaceae, Passifloraceae, Plumbaginaceae, Portulacaceae, Rhamnaceae, Rutaceae, out of which plant family Fabaceae was the most diverse and widely distributed Larval-host plant family. Butterflies being a bio-indicator clarifies that the finding of 68 species of butterflies is an indication of the good environmental health of the GHSC campus and its surroundings.

Keywords: Bioindicator, Herbivorous, Holometabolous, Microhabitat, Phytophagous, Pupa.

1. Introduction

The availability of butterflies depends on their larval-host plants and food-nectar plants because their holometabolous metamorphosis and nutrition take place on the plants. They lay their eggs on plants, then those eggs hatch into larvae, which feed the leaves of plants. When they pupate, their pupa remains attached to the nodes, internodes, and leaves of plants, and when they emerge as an adult individual, they suck nectar from their food-nectar plants. An example of cospeciation of the two groups that may be linked to stepwise coevolution is a long-standing historical association between butterflies and the plants that serve as their hosts [1, 2]. It is believed that interactions between herbivorous insects and their host plants are what contribute to their enormous diversity [3]. In terms of species richness, the Lepidoptera are one of the most abundant groups of phytophagous insects that are still alive, and this order contains many different species that can be found in almost every region and type of habitat [4]. Butterflies are insects from the class Insecta, and they are classified in the order Lepidoptera. They serve a variety of vital functions in the ecosystem. Butterflies help to restore ecosystems by pollinating and providing food. Increased butterfly populations within restored areas may indicate an increase in plant diversity and other pollinator groups [5]. Butterflies are one of numerous insects thought to be potential ecological indicators of forest environmental health. Indicator species are believed to either signal the presence or abundance of other species or to communicate chemical or physical changes in the environment through changes in their own presence or abundance [6-8]. Butterflies living in a particular place have particular habitat requirements. An interesting part of studying localised butterflies is learning to find out the microhabitats they require [5]. In an ecosystem, natural events either favour or reduce the butterfly population's characteristics of microhabitats occurring in that ecosystem [9, 5].

In the current study, a thorough investigation was conducted to document the variety of butterfly species found at Government Holkar Science College, Indore, as well as the presence of plants that serve as the larval hosts for butterflies on the campus of GHSC.

2. Materials and Methods

2.1 Study Area: The present investigation has been carried out at the campus of Government Holkar Science College, Indore, Madhya Pradesh, India. The area of the GHSC campus is about 35 acres, situated at a height of 553m MSL, south-east direction (Latitude-22°.41' and Altitude-75°.32), near to the centre of the city. The 14 gardens, 2 open spaces, and 1 botanical park on the GHSC campus are all richly planted with different kinds of herbs, shrubs, and trees. The climate of Indore has three distinct seasons every year based on temperature, humidity, and rainfall: rainy (July to October), winter (November to February), and summer (March-June).

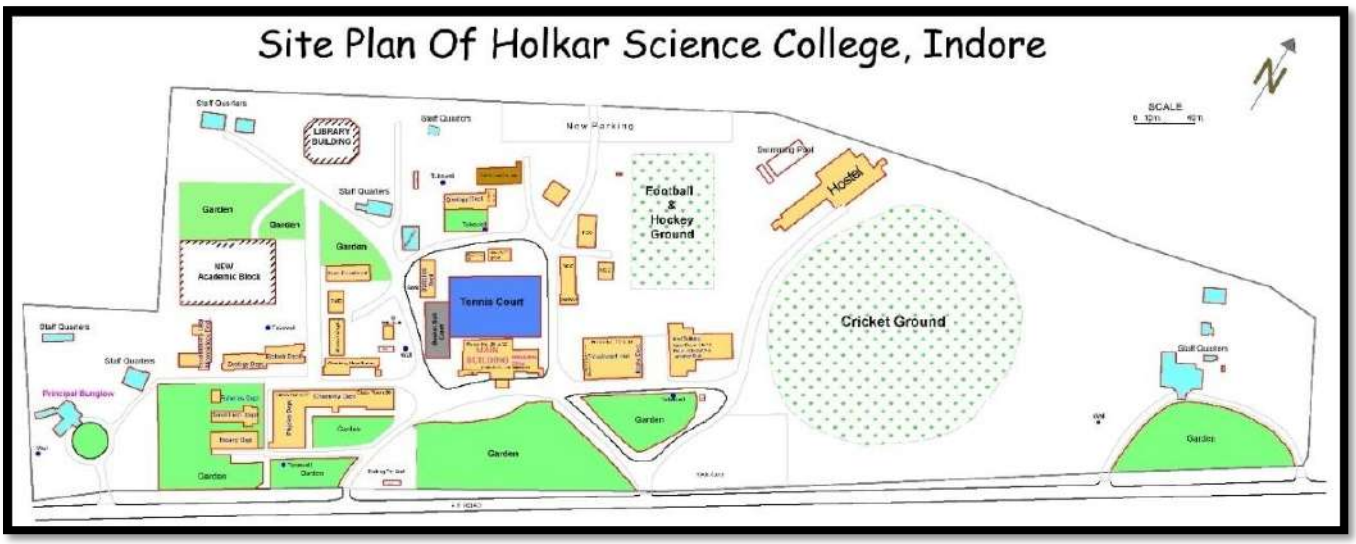

Figure 1.Map of Study Area: Government Holkar Science College, Indore, shaded green part indicating the gardens. [22].

2.2 Field Survey: Daily field surveys were conducted on the specific trails present in the campus of GHSC from October 2021 to June 2022. The observations were mainly done daily from 07:00 AM to 11:00 AM and 03:00 PM to 05:00 PM [10] using binoculars, photography cameras, and phone cameras, and recorded butterflies were identified by field guides Butterflies Of India (Smetacek, 2016) [11], The Book of Indian Butterflies (Kehimker, 2008) [12] and Butterflies of India (Singh, 2020) [13], and the keys of Antrum (2002) [14], Bingham (1905) [15], Daccordi et al.(1988) [16], Evans(1932) [17], Kehimkar (2008) [12], Kunte (1997) [18], Kunte (2000) [10], Smart(1991) [19], Talbot(1939) [20] and Wynter- Blyth(1957) [21]. The butterflies recorded during the survey are classified as Very Common (VC), Common (C), Rare (R), and Very Rare (VR) [23, 24].

2.3 Butterfly Identification Database: The online website IFoundButterflies (Indian Foundation For Butterflies, (supported by NCBS-National Centre For Biological Sciences) [25], is an online butterfly database on which photographs of butterflies are uploaded and validated by various professionals. The photographs which were clicked during the daily field surveys have also been identified with the help of this database website.

3. Result

Table 1. Butterfly species with the family they belong, scientific names and their abundance status recorded during the study.

FAMILY	COMMON NAME	SCIENTIFIC NAME	VC	C	R	VR
Family I: HESPERIIDAE	1. Small Branded Swift	*Pelopidas mathias*				+
	2. Rice Swift	*Borbo cinnara*				+
	3. Indian Palm Bob	*Suastus gremius*				+
	4. Indian Grizzled Skipper*	*Spialia galba*				+
	5. Common Banded Awl	*Hasora chromus*			+	
	6. Brown Awl	*Badamia exclamationis*				+
Family II: LYCAENIDAE	7. Red Pierrot	*Talicada nyseus*	+			
	8. Common Pierrot	*Castalius rosimon*	+			
	9. Angled Pierrot*	*Caleta decidia*				+
	10. Rounded Pierrot	*Tarucus extricatus*				+
	11. Zebra Blue	*Tarucus plinius*	+			
	12. Gram Blue	*Euchrysops cnejus*	+			
	13. Pale Grass Blue	*Pseudozizeeria maha*	+			
	14. Dark Grass Blue	*Zizeeria karsandra*		+		
	15. Tiny Grass Blue	*Zizula hylax*	+			

	16. Lesser Grass Blue	*Zizina otis*		+		
	17. Plains Cupid	*Luthrodes pandava*				+
	18. Small Cupid	*Chilades parrhasius*				+
	19. Forget-Me-Not	*Catochrysops strabo*				+
	20. Common Cerulean	*Jamides celeno*		+		
	21. Pea Blue	*Lampides boeticus*				+
	22. Lime Blue	*Chilades lajus*				+
	23. Large Oakblue	*Arhopala amantes*				+
	24. Common Lineblue	*Prosotas nora*		+		
	25. Tailless Lineblue	*Prosotas dubiosa*		+		
	26. Common Red Flash*	*Rapala iarbus*				+
	27. Peacock Royal	*Tajuria cippus*				+
Family III: NYMPHALIDAE	28. Common Castor	*Ariadne merione*	+			
	29. Tawny Coster	*Acraea terpsicore*		+		
	30. Common Leopard	*Phalanta phalantha*				+
	31. Peacock Pansy	*Junonia almana*			+	
	32. Lemon Pansy	*Junonia lemonias*	+			
	33. Chocolate Pansy	*Junonia iphita*		+		
	34. Grey Pansy	*Junonia atlites*			+	
	35. Yellow Pansy	*Junonia hierta*			+	
	36. Blue Pansy	*Junonia orithya*			+	
	37. Baronet	*Euthalia nais*				+
	38. Great Eggfly	*Hypolimnas bolina*	+			
	39. Danaid Eggfly	*Hypolimnas misippus*	+			
	40. Common Sailor	*Neptis hylas*		+		
	41. Common Baron	*Euthalia aconthea*		+		
	42. Blue Tiger	*Tirumala limniace*		+		
	43. Plain Tiger	*Danaus chrysippus*	+			
	44. Striped Tiger	*Danaus genutia*			+	
	45. Common Evening Brown	*Melanitis leda*		+		
	46. Dark Evening Brown	*Melanitis phedima*		+		
	47. Common Crow	*Euploea core*	+			
	48. Lesser Three-ring	*Ypthima inica*				+
	49. Common Three-ring	*Ypthima asterope*				+
Family IV: PAPILIONIDAE	50. Common Mormon	*Papilio polytes Cr*	+			
	51. Common Lime Swallowtail	*Papilio demoleus L.*		+		
	52. Tailed Jay	*Graphium Agamemnon L.*		+		
	53. Common Jay	*Graphium sarpedon*		+		
Family V: Pieridae	54. Common Grass Yellow	*Eurema hecabe*	+			
	55. Small Grass Yellow	*Eurema brigitta*		+		
	56. One Spot Grass Yellow	*Eurema andersonii*	+			
	57. Three Spot Grass Yellow	*Eurema blanda*			+	
	58. Spotless Grass Yellow	*Eurema laeta*		+		
	59. Common Emigrant	*Catopsilia crocale pomona F.*	+			
	60. Mottled Emigrant	*Catopsilia pyranthe L.*		+		
	61. Common Gull	*Cepora nerissa F.*		+		
	62. Lesser Gull	*Cepora nadina*		+		
	63. Common Jezebel	*Delias eucharis*	+			
	64. Common Wanderer	*Pareronia valeria*		+		
	65. Psyche	*Leptosia nina*				+
	66. Pioneer	*Belenois aurota*	+			
	67. Plain Orange Tip	*Colotis aurora*				+
	68. White Orange Tip	*Ixias marianne*				+

Where, VC = Very Common, C = Common, R = Rare and VR = Very Rare*=First reporting from Indore district.

Table 2. Butterfly larval-host plants, scientific name of plants and plant family, recorded during the study.

BUTTERFLY SPECIES	SCIENTIFIC NAME OF LARVAL HOST-PLANT	COMMON NAME OF LARVAL HOST-PLANT	PLANT FAMILY
Red Pierrot	1. *Bryophyllum pinnatum*	Paththarchatta	**Crassulaceae (Stonecrops)**
Common Pierrot	2. *Ziziphus jujuba*	Ber	**Rhamnaceae (Buckthorns)**
Zebra Blue	3. *Plumbago zeylanica*	Chitrak	**Plumbaginaceae**
Pale Grass Blue	4. *Oxalis corniculata*	Khatti Buti	**Oxalidaceae (Wood Sorrels)**
Dark Grass Blue	5. *Oxalis corniculata*	Khatti Buti	
Plains Cupid	6. *Cycas revoluta*	Sago Palm	**Cycadaceae**
Forget-Me-Not	7. *Tephrosia purpurea*		**Fabaceae (Leguminosae)**
Common Cerulean	8. *Abrus precatorius*	Rosary Pea	
Common Lineblue	9. *Acacia catechu*	Kher	

Tailless Lineblue	*10. Acacia catechu*	Kher	
Common Grass Yellow	*11. Cassia tora*	Pawar	
Small Grass Yellow	*12. Cassia sp.*		
Three Spot Grass Yellow	*13. Cassia sp.*		
Indian Palm Bob	*14. Tamarindus indica*	Tamarind	
Common Banded Awl	*15. Pongamia pinnata*	Karanj	
Common Emigrant	*16. Cassia fistula*	Amaltas	
Mottled Emigrant	*17. Cassia fistula*	Amaltas	
Common Jezebel	*18. Dendrophthoe falcata*	Mistletoe	**Loranthaceae**
Common Gull	*19. Capparis zeylanica*	Capers	**Capparaceae**
Common Wanderer	*20. Capparis zeylanica*	Capers	
Pioneer	*21. Capparis spinosa, Maeruaoblongifolia*	Capers	
Common Castor	*22. Ricinus communis*	Arandi	**Euphorbiaceae (Spurges)**
Tawny Coster	*23. Passiflora foetida*	Passion Flower	**Passifloraceae**
Peacock Pansy	*24. Hygrophila auriculata*	Talimkhana	**Acanthaceae**
Lemon Pansy	*25. Hygrophila auriculata*	Talimkhana	
Chocolate Pansy	*26. Hygrophila auriculata*	Talimkhana	
Grey Pansy	*27. Hygrophila auriculata*	Talimkhana	
Yellow Pansy	*28. Hygrophila auriculata*	Talimkhana	
Blue Pansy	*29. Justicia procumbens*	Justicia	
Great Eggfly	*30. Portulaca oleracea*	Purslane	**Portulacaceae (Purslanes)**
Danaid Eggfly	*31. Portulaca oleracea*	Purslane	
Common Sailor	*32. Salmaliamalabarica*	Cotton Sp.	**Bombacaceae**
Common Baron	*33. Mangifera indica*	Mango	**Anacardiaceae (Cashew)**
Plain Tiger	*34. Calotropis procera*	Safed Aak	**Apocynaceae (Dogbanes)**
Common Crow	*35. Ficus benghalensis*	Banyan	**Moraceae (Mulberry)**
Common Mormon	*36. Aegle marmels*	Bael	**Rutaceae (Citrus)**
Common Lime Butterfly	*37. Citrus limon*	Lemon	
Tailed Jay	*38. Polyalthia longifolia*	Ashok	**Annonaceae (Custard Apples)**
Common Jay	*39. Polyalthia longifolia*	Ashok	
Brown Awl	*40. Terminalia belerica*	Behra	**Combretaceae (White Mangrove)**

The current investigation yielded a total of 68 species of butterflies, of which the family Nymphalidae dominated with 22 species, followed by the Lycaenidae (21 species), Pierdiae (15 species), Hesperiidae (6 species), and Papilionidae (4 species) families.

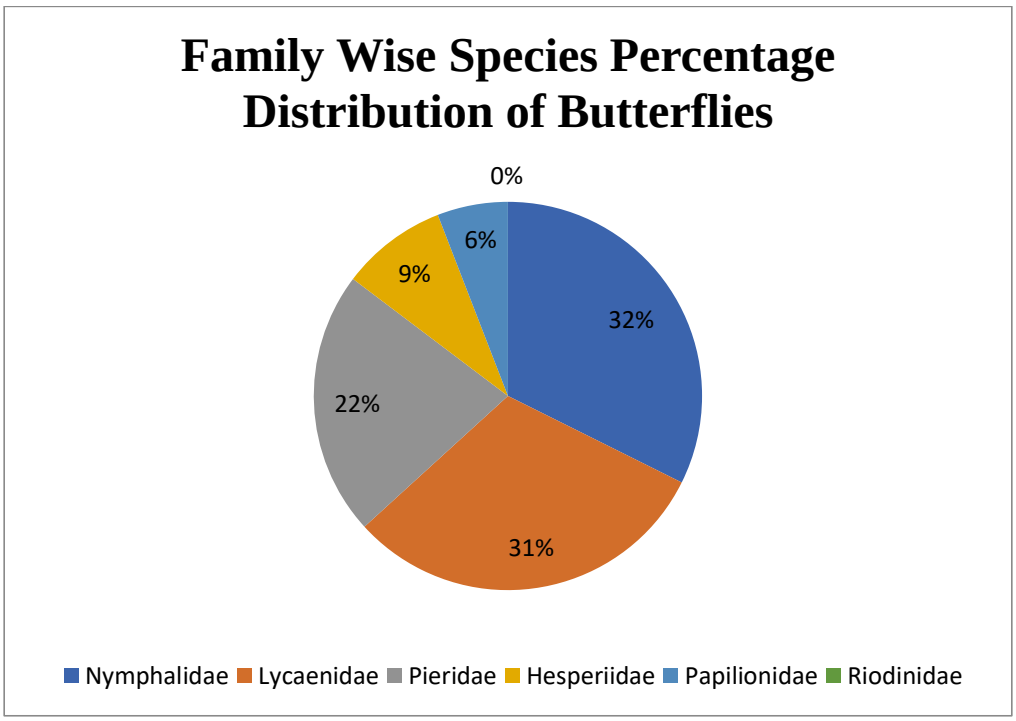

Figure 2. Family Wise Species Percentage Distribution of Butterflies

The most numerous and dominant butterfly species observed during the survey were Common Grass Yellow (*Eurema hecabe*), Lemon Pansy (*Junonia lemonias*), Common Emigrant (*Catopsilia crocale pomona F.*), Red Pierrot (*Talicada nyseus*), Pale Grass Blue (*Pseudozizeeria maha*), and Tiny Grass Blue (*Zizula hylax*) throughout the investigation, and Plain Tiger (*Danaus chrysippus*) and Pioneer (*Belenois aurota*) in summer months (April to June).

Common Three-ring (*Ypthima asterope*), Lesser Three-ring (*Ypthima inica*), White Orange Tip (*Ixias marianne*), Plain Orange Tip (*Colotis aurora*), Psyche (*Leptosia nina*), Peacock Royal (*Tajuria cippus*), Large Oakblue (*Arhopala amantes*), Common Leopard (*Phalanta phalantha*), Lime Blue (*Chilades lajus*), and Pea Blue (*Lampides boeticus*), the sighting of these butterflies were very rare.

Angled Pierrot (*Caleta decidia*) Fig. 3.(a), Common Red Flash (*Rapala airbus*) Fig. 4.(b), and Indian Grizzled Skipper (*Spialia galba*) Fig. 5.(c), these three butterflies are first reporting from Indore district.

Figure 3. (a)

Figure 4. (b)

Figure 5. (c)

A total of 30 plants, representing 19 different families and 28 different genera, were also identified as butterfly larval-host plants. The plant family Fabaceae, which is also known as the Leguminosae family, was the most dominating family over all the recorded families. Out of 40 plants, 11 plants belong to the family Fabaceae. The family Acanthaceae was the second dominating plant family with 6 species.

Many butterfly diversity studies have been carried out in recent years at the campus of the Government Holkar Science College, Indore. The data from those studies suggests that the diversity of butterflies has significantly grown over time, and the reason for this growth is ongoing planting and greater upkeep of the gardens and surrounding areas of the GHSC campus.

During the years 2014–2015, Pawar et al., (2017) [26], studied the diversity of butterflies and their larval host-plant. Their study found 41 species of butterflies from the families Nymphalidae (19), Pieridae (08), Lycaenidae (07), Papilionidae (05) and Hesperiidae (02), and 44 larval-host plant species from 23 different families. During the years 2014–2016, Pawar & Prakash (2016) [27], conducted the butterfly diversity investigation, and they concluded that there were 40 butterfly species belonging to the families Nymphalidae (19), Pieridae (08), Lycaenidae (06), Papilionidae (05) and Hesperiidae (02) in the campus of GHSC. During the years 2018–2021, Sharma (2021) [28], investigated the diversity of butterflies from various families and their investigation resulted in the finding of 47 species of butterflies from the families, Nymphalidae (21), Pieridae (09), Lycaenidae (09), Papilionidae (06) and Hesperiidae (02). The very recent butterfly diversity study was done by Alone & Jat (2021) [29], during the years 2020-2021. They have found 51 species of butterflies in the family Nymphalidae (21), Pieridae (11), Lycaenidae (11), Papilionidae (05) and Hesperiidae (03).

All of the recent studies suggest that the family Nymphalidae is the most dominant butterfly family over the years. The families Papilionidae and Hesperiidae are the butterfly families with the least number of species recorded. There were no records of any species of the butterfly family Riodinidae.

4. Discussion

This research describes the correlation between butterflies and their host plants, and it suggests that the ancestors of all host plants were legumes, which are members of the Leguminosae family. Numerous butterfly species have evolved, and as a result, their oviposition and larval feeding preferences have begun to focus on the modified versions of the original host plant. These plants are host-specific [1]. This shows the co-evolutionary relationship of modern representatives of the ancestral host plant with the butterflies.

An effort has been made to comprehend the factors that contribute to changes in butterfly biodiversity in relation to the type of habitat they inhabit and to determine whether it would be appropriate to use these little animals as local environmental indicators. The presence of such a large number of butterflies indicates the natural environmental health of the GHSC campus is very good. For its sustainable healthy nature, we should take care of the diversity of its host plants.

Butterflies play various important roles, and they are a major part of the ecosystem. They are also considered a central pollinator as they are an important agent of entomophily [28]. The interruption of natural processes by humans, rapid changes in landscapes, climate change, and habitat destruction are major sources and factors that affect the distribution and diversity of butterflies.

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DIVERSITY AND RELATIVE ABUNDANCE O BUTTERFLY SPECIES OF FAMILY LYCAENIDAE (ORDER: LEPIDOPTERA) AT GOVT. HOLKAR SCIENCE COLLEGE, INDORE (M.P)

Harsh Vishwakarma[1], Grishma Trivedi[2], Sneha Hire[2], Kratika Patidar[2] and V.K. Sharma[2]*

1. Deptt. of Biotechnology, Govt. Holkar (Model, Autonomous) Science College, Indore (M.P.)

2. : Deptt. of Zoology, Govt. Holkar (Model, Autonomous) Science College, Indore (M.P.)

*Corresponding Author: vishwakarmah68@gmail.com

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ABSTRACT :The present study has been carried out to investigate the diversity status of butterflies of butterfly family Lycaenidae at the campus of Government Holkar Science College, which is situated in a region of Indore where a dense population resides. This investigation was conducted over a period of 9 months, from October 2021 to June 2022. A total of 21 species of butterfly of the family Lycaenidae are found from 18 different genera, 2 subfamilies, and 4 tribes. 9 new species for the study area has also recorded. The Lycaenidae butterflies commonly look blue when they open their wings. The structure and number of black spots, lines, and curves on the underside surface of wings make them identifiable. The identification of these butterflies required the keen study of their analogs. The slight difference in the analogue of individuals changes the species. Taking all the identification keys into consideration, this investigation has been done. The Campus of Holkar Science College and its central gardens were taken into the study area for the broad findings of Lycaenidae butterflies. The butterflies recorded are very common- 4, common-6, less common-2, rare 4, and very rare-5. Remarkable findings of this study are Common Red Flash, Angled Pierrot, Large Oakblue, Rounded Pierrot, Dark Grass Blue, Tiny Grass Blue, Plains Cupid, Forget-Me-Not, Pea Blue, Common Lineblue, and Tailless Line blue. The most abundant butterfly species are Red Pierrot, Zebra Blue, Gram Blue, and Tiny Grass Blue observed on campus. The purpose of this study is to conserve these important species of butterflies, which indicate environmental health condition.

KEY WORDS : Database, Diversity, Entomophily, Holometabolous, Landscape.

1. INTRODUCTION

Butterflies are insects having colored scaly wings. They belong to the order Lepidoptera of class insecta. Butterflies are very reactive in nature towards varying environmental disturbance and variations. They are a very important constituent of open habitat and they are considered as an indicator of environmental quality (Kocher & William, (2000). They are also considered as a central pollinator because they keep visiting flowers for nectar consumption (Sharma, 2021). The butterfly superfamily Papilionoidae consists of six different families out of which the family Lycaenidae covers 30-40% species of total species. Lycaenids are very small butterflies from all other species from different families and these are also known as "Blues", "Coppers", "Hairstreaks", and "Metalmarks" (Kanagaraj & Kathirvelu, 2018). The largest Lycaenid found in India is Large Oakblue (Arhopala amantes) with a wingspan of 51mm (Wikipedia), and smallest lycaenid is Grass Jewel (Chilades trochylus) with a wingspan of 15mm. The study of butterflies of Lycaenidae becomes very interesting because they possess various different intriguing characters and features. Many butterfly species of Lycaenidae family shows association with ants, termed as Myrmecophily. This relationship is likely to be based on specific exocrine gland secretions and vibrational communication (Fielder, 1995). A butterfly Red Pierrot (Talicada nyseus), its larvae forms a burrow in the fleshy leaves of Bryophyllum and spends its larval stage in the middle of leaves till the pupation.

2. MATERIALS AND METHODS

2.1 Study Area

The study area for this investigation was the campus of Government Holkar Science College, located in the Indore district. It is a 34-acre campus located at 2241 latitude and 7552 longitude, at a height of 553 meters above mean sea level. Indore is located in Western Madhya Pradesh, and the region's vegetation is predominantly dry deciduous. (Pawar & Prakash, 2016). The campus consists of 14 gardens with various trees, shrubs and grassland area. (Sharma, 2021).

2.2 Daily Field Observations

Daily field observations and surveys were done in the morning from 07:00 AM to 11:00 AM (Kunte, 2000). Camera, binoculars and field guides was taken in use for species recording and identification. Line transect method (Kunte, 2000) and sometimes the Pollard Walk Method were also used (Pollard *et al.,* 1995). All the butterflies are identified on field while observation using field guides Butterflies of India (Smetacek, 2016). The Book of Indian Butterflies (Kehimker, 2008) and Butterflies of India (Singh, 2020).

On the basis of abundance of butterflies species, they are divided into five groups as follows VR-very rare (5-25 sightings) (1-5 sightings), R-rare (5-25 sightings), LC-less common (25-50 sightings), C-common (50-75 sightings) and VC-very common (75-100 sightings) (Nimbarlkar et al., 2011). IFoundButterflies is an online butterfly database where images of butterflies are posted and verified by different experts. It is run by the Indian Foundation For Butterflies and supported by the National Centre for Biological Sciences (Kunte, 2022). With the use of this database online, it has also been possible to identify the photos that were taken during the daily field surveys (Vishwakarma *et al*., 2022).

3. RESULT AND DISCUSSION

Table 1. Butterflies with their sub family, tribe, common name, scientific name and relative abundance status.

S.No.	SUBFAMILY	TRIBE	COMMON NAME	SCIENTIFIC NAME	RELATIVE ABUNDANCE
1	Polyommatinae	Polyommatini	Red Pierrot	*Talicada nyseus*	*****
2	Polyommatinae	Polyommatini	Common Pierrot	*Castalius rosimon*	****
3	Polyommatinae	Polyommatini	Angled Pierrot	*Caleta decidia*	* ^
4	Polyommatinae	Polyommatini	Rounded Pierrot	*Tarucus extricates*	* ^
5	Polyommatinae	Polyommatini	Zebra Blue	*Tarucus plinius*	*****
6	Polyommatinae	Polyommatini	Gram Blue	*Euchrysops cnejus*	*****
7	Polyommatinae	Polyommatini	Pale Grass Blue	*Pseudozizeeria maha*	****
8	Polyommatinae	Polyommatini	Dark Grass Blue	*Zizeeria karsandra*	**** ^
9	Polyommatinae	Polyommatini	Tiny Grass Blue	*Zizula hylax*	***** ^
10	Polyommatinae	Polyommatini	Lesser Grass Blue	*Zizina otis*	****
11	Polyommatinae	Polyommatini	Plains Cupid	*Luthrodes pandava*	*** ^
12	Polyommatinae	Polyommatini	Small Cupid	*Chilades parrhasius*	**
13	Polyommatinae	Polyommatini	Forget-Me-Not	*Catochrysops Strabo*	*** ^
14	Polyommatinae	Polyommatini	Common Cerulean	*Jamides celeno*	****
15	Polyommatinae	Polyommatini	Pea Blue	*Lampides boeticus*	** ^
16	Polyommatinae	Polyommatini	Lime Blue	*Chilades lajus*	**
17	Polyommatinae	Polyommatini	Common Lineblue	*Prosotas nora*	** ^
18	Polyommatinae	Polyommatini	Tailless Lineblue	*Prosotas dubiosa*	**** ^
19	Theclinae	Arhopalini	Large Oakblue	*Arhopala amantes*	* ^
20	Theclinae	Lolaini	Common Red Flash	*Rapala airbus*	* ^
21	Theclinae	Deudorigini	Royal Peacock	*Tajuria cippus*	*

*****very common ****common ***less common **rare, *very rare ^ new sighting in the campus.

This investigation began after the monsoon of year 2021 and finished till the middle of summer 2022. Daily field visits made during the periods of 9 months from October 2021 to June 2022. Table 1. represents the relative abundance of butterflies of family Lycaenidae. 21 species of butterflies from 18 genera were identified under the family Lycaenidae. The butterflies were grouped under 2 subfamilies namely Polyommatinae and Theclinae and four Tribes viz., Polyommatini, Arhopalini, Lolaini and Deudorigini.

According to early research and prior investigations, there is an enormous rise in the diversity and relative abundance of butterflies at Government Holkar Science College, Indore. The previously published research articles and data suggest that each new diversity investigation has reported new findings of Lycaenidae butterflies at the same study area.

Pawar & Prakash (2016) reported the relative abundance of butterflies from five families, the diversity of Lycaenidae family were very common (3) and common (3) at the same study area. A study carried out at same study area by Pawar *et al.* (2017) suggests that from the year 2014 to 2016 there were (3) very common, (3) common and (1) rare species of Lycaenidae butterflies out of various families. Sharma (2021) studied the diversity and relative abundance of butterflies of different butterfly families at the same study site and reported 9 species of Lycaenidae out of which 3 species were very common, 3 were common, 1 was rare and 2 very rare findings. The results of the investigation done by Alone & Jat (2021) concluded that there were (3) very common, (4) common, (4) rare and (1) very rare species were present at same study area.

In table 1. symbol ^ marks the new species sighting after the previous studies. A total of 9 new species were spotted which are as Angled Pierrot, Common Lineblue, Common Red Flash, Dark Grass Blue, Forget-Me-Not, Large Oakblue, Pea Blue, Plains Cupid, Rounded Pierrot, Tailless Lineblue and Tiny Grass Blue.

Butterflies in the Lycaenidae family are typically small, and because most of them have similar wing patterns and structures, identifying them can be challenging. Because of their identical wing patterns and structure, most of their species appear to be the same to the observer, which is why many studies only list a few species.

In the present study, the presence of such a number of butterflies of family Lycaenidae is entirely attributable to the diverse plantation of their host-larval plants and food-nectar plants. The campus of Government Holkar Science College, Indore, hosts a very suitable environment and sustains various habitats for the butterflies and offers the ideal environment for the development and distribution of butterflies.

5. CONCLUSION

The finding of 21 butterfly species of Lycaenidae family is an indication of a less polluted and healthy environment of the campus of Government Holkar Science College. The existence of diverse flora and plantation is a reason behind the enormous distribution of butterflies. The daily field observations and continuous visits to the study area helped to find out such a number of butterfly species.

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Figure 1. Photographs of butterflies shot during the observations (arranged in same order as the observation table 1.)

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A CHECKLIST OF DIVERSITY OF BUTTERFLIES IN MADHYA PRADESH, INDIA

SNEHA NAIR and V. K. SHARMA

Department of Zoology, Holkar Science College, Indore (M.P.)

ABSTRACT : A checklist of butterfly species diversity recorded from Madhya Pradesh. A total of 166 species belonging to 7 families were recorded. Madhya Pradesh also known as Heart of India is largest state of central India covering an area of 3,08,252 sq/km which is 9.38% of the total geographical area of the country. It shares its border with Uttar Pradesh, Chhattisgarh, Maharashtra, Gujarat, and Rajasthan. Total forest area of Madhya Pradesh is 80.9 million hectare and consists of 11 National parks and 25 sanctuaries spread over an area of 10,862 km that is 11.40% of total forest area. The vegetation is mostly deciduous forests with mixed forest as well. Being rich in vegetation Madhya Pradesh is home to several species of butterflies. Studies on butterflies of central India dates back to Forsayeth (1884), Swinhoe (1886), Betham (1890,1891) and Witt (1990). Some books on fauna in Madhya Pradesh include Evans,1932; Talbot,1939,1947 and Wynter-Blyth,1957. In recent years several enthusiast have studied butterflies in M.P. This paper is compilation of all the studies and records of species of butterflies found in M.P.

Key words : *Checklist, Butterflies, Species, Madhya Pradesh.*

INTRODUCTION

Butterflies are beautiful flying creatures that humans are attracted to since ages. They are not only beautiful but play a very important role in our ecosystem. They act as pollinators and transfer pollen grains while they are feeding on the nectar from the flowers. Butterflies also help in producing genetic variation in the plants as some butterfly species migrate over long distance and share pollens across plants which are far away from one another. This helps plants to become disease resistant. Butterflies are an important part of food web. They act as a food source for many birds, spiders, bats and lizards. It is observed that breeding season of many birds depend upon maximum availability of caterpillars to feed their young ones. Loss of butterflies will result in the collapse a delicate ecosystem.

The world is facing a very big problem of biodiversity loss due to increase in pollution, population, habitat destruction and global warming. Increase in temperature due to global warming and decrease in precipitation adversely affects ecosystem. Analysis of the impact of these changes on our ecosystem is very important. Also due to these changes in environment many organisms are extinct, while some are endangered which further disturb the ecological balance. Biodiversity conservation and management is therefore a worldwide concern. Bio-indicators play a very important role in the conservation and management of biodiversity. Bio-indicators are group of living organisms which are used to assess the health of the natural ecosystem and biogeographic changes taking place in the environment.

Butterflies are considered as one of the best bio-indicators as they are extremely sensitive to any changes in their environment like temperature, light ,rainfall, humidity & loss of habitat .They also have short life cycle due to which their response to change is quick and easily visible. Butterflies are indicators of a healthy environment. Their abundance indicates healthy ecosystem whereas decrease in their number shows disturbance in ecosystem. Change in Habitat & climate coupled with the loss of habitat are the biggest threat to butterflies. At present there are 315 butterfly species in red data Book, and many of them are extinct. Therefore survey to evaluate status of butterflies is very important for conservation of butterflies and ecosystem.

Table. 1 List of butterflies recorded from Madhya Pradesh.

S.	Species	Common name	Distribution
	Family : Papilionidae		
1.	*Graphium agammenon* (Linn.)	Tailed Jay	Hoshangabad, Nimar, Umaria (Chandra et al.,2000b; Choudhary & Khan, 2002), Indore (Pawar *et al.*,2017), Ujjain (Shouche *et al.*,2015)
2.	*Graphium sarpedon* (Linn.)	Common blue bottle	Panna, Umaria (Choudhary & Khan,2002 and Siddiqui & Singh,2004)
3.	*Graphium sarpedon*	Common jay	Indore (Pawar *et al.*,2017), Ujjain (Shouche *et al*.,2015), Betul (Bhowate et *al.*,2020), Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla,2016)
4.	*Pathysa nomius nomius*	Spot swordtail	Balaghat, Hoshangabad, Mandla, Panna, Seoni, Umaria (Siddiqui & Singh 2004; Chandra *et al.,*2002; Choudhary & Khan,2002; Chandra *et al.*,2000b; Betham,1890-91), Kanha-pench (Harsh *et al.*,2015), Indore (Pawar *et al.*,2017)

*Corresponding author (email : kidtelevision@gmail.com) Received 28.04.2021 Accepted 10.05.2021

5.	*Papilio crino* Fabricius	Common Banded peacock	
6.	*Papilio demoleus demoleus*	Lime Butterfly	Balaghat, Bhind, Bhopal, Chhindwara, Chhatarpur, Dhar, Hoshangabad, Indore, Jabalpur, Mandla, Sidhi (Siddiqui & Singh,2004; Chandra *et al.*, 2000a), Indore (Pawar et al.,2017), Kanha-Pench corridor (Sharma *et al.*, 2014), Ujjain (Shouche *et al.*,2015), Betul (Bhowate *et al.*,2020) Bhopal (Mishra *et al.*,2014, Harsh,2014); Shahdol (Maini *et al.*,2017); Ujjain (Kesharwani & Shukla,2016)
7.	*Papilio polymnestor* Cramer	Blue Mormon	Jabalpur, Umaria (Choudhary & Khan,2002), Betul (Bhowate *et al.*,2020)
8.	*Papilio polytes romulus*	Common Mormon	Bhind, Bhopal, Chhindwara, Chhatarpur, Dhar, Hoshangabad, Indore, Jabalpur, Mandla, Panna, Sidhi, Umaria (Siddiqui & Singh,2004; Choudhary& Khan,2002; Chandra *et al.*.,2000a,b), Indore (Pawar *et al.*, 2017), Kanha-Pench corridor (Sharma *et al.*,2014), Bhopal (Harsh,2014) Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla,2016)
9.	*Chilasa clytia clytia* (Linn.)	Common Mime	Balaghat, Mandla, Seoni, (Chandra et al.,2002; Choudhary & Khan,2002), Bhopal (Mishra *et al.*,2014; Harsh,2014)
10.	*Pachliopta aristolochiae* Fabricius	Common Rose	Balaghat, Mandla, Umaria (Choudhary & Khan,2002), Kanha-Pench corridor (Sharma *et al.*,2014), Betul (Bhowate *et al.*,2020)
11.	*Pachliopta hector* (Linn.)	Crimson Rose	Balaghat, Mandla, Hoshangabad, Panna, Seoni, Umaria (Chandra *et al.*, 2000b, 2002; Choudhary & Khan,2002; Siddiqui & Singh,2004), Bhopal (Mishra *et al.*,2014; Harsh,2014)
	Family : Pieridae		
12.	*Pieris canidia indica* Evans	Indian Cabbage White	Panna (Siddiqui & Singh,2004); Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla,2016)
13.	*Belonois aurota aurota* (Fabricius)	Pioneer	Balaghat, Bhind, Bhopal, Hoshangabad, Jabalpur, Mandla, Mandsor, Morena, Panna, Ratlam, Seoni, Sidhi, Ujjain, Umaria (Chandra *et al.*,2000a, b; Chandra *et al.*,2002; Choudhary & Khan,2002; Siddiqui & Singh,2004), Indore (Pawar *et al.*,2017); Ujjain (Shouche *et al.*,2015), Bhopal (Harsh,2014)
14.	*Cepora nerissa phryne* (Fabricius)	Common Gull	Bhind, Chhatarpur, Chhindwara, Dhar, Gwalior, Hoshangabad, Indore, Jabalpur, Mandsaur, Morena, Panna, Sidhi, Shivpuri, Ujjain, Umaria (Siddiqui & Singh,2004; Choudhary & Khan,2002; Chandra *et al.*,2000a,b), Indore (Pawar *et al.*,2017), Kanha-Pench corridor (Sharma et al.,2014), Bhopal (Harsh,2014), Ujjain (Shouche *et al.*,2015), Betul (Bhowate *et al.*,2020)
15.	*Delias eucharis* (Drury)	Common Jezebel	Balaghat, Betul, Chhindwara, Hoshangabad, Indore, Jabalpur, Mandla, Narsinghpur, Panna, Shahdol ,Shivpuri, Umaria (Chandra *et al.*,2000b; Choudhary *et al.,*,2002; Siddiqui & Singh,2004), Kanha-Pench corridor (Sharma *et al.,*2014), Betul (Bhowate *et al.*,2020), Bhopal (Mishra *et al.*, 2014; Harsh,2014)
16.	*Appias libythea libythea* (Fabricius)	Striped Albatross	Chhindwara, Dhar, Nimar, Umaria (Choudhary & Khan,2002)
17.	*Appias albina Boisdual*	Common Albatross	Umaria (Choudhary & Khan,2002)
18.	*Appias indra* (Moore)	Plain Puffin	Umaria (Choudhary & Khan,2002)
19.	*Appias paulina paulina* (Cramer)	Ceylon Lesser Albatross	Sagar (Betham,1890-91)
20.	*Leptosia nina nina* (Fabricius)	Psyche	Balaghat, Jabalpur, Mandla, Umaria (Choudhary & Khan,2002), Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla,2016)
21.	*Ixias marianne* (Cramer)	White Orange Tip	Bhind, Chhattarpur, Datia, Dhar, Gwalior, Jhabua, Mandsaur, Morena, Ratlam, Sihore, Shivpuri, Ujjain, Umaria (Choudhary & Khan,2002), Kanha Pench corridor (Sharma *et al.*,2014), Ujjain (Shouche *et al.*,2015), Indore (Pawar *et al.*,2017)
22.	*Ixias pyrene sesia* (Linn.)	Yellow Orange Tip	Mandsaur, Ujjain, Umaria (Choudhary & Khan,2002), Shahdol (Maini *et al.*,2017)
23.	*Hebomoia glaucippe glaucippe* (Linn.)	Great Orange Tip	Hoshangabad (Chandra,2000b)
24.	*Colotis amata* (Fabricius)	Small Salmon Arab	Bhind, Nimar (Witt,1909)
25.	*Colotis danae danae* (Fabricius)	Crimson Tip	Nimar (Wynter-Blyth,1957)
26.	*Colotis etrida etrida* (Boisduval)	Small Orange Tip	Bhind, Hoshangabad, Mandsaur Morena, Nimar (Chandra *et al.*,2000b)
27.	*Colotis eucharis* Boisduval	Plain Branded Tip	Central India, Bhind, Morena (Wynter-Blyth,1957), Bhopal (Harsh,2014)
28.	*Colotis fausta fausta* (Oliver)	Large Salmon Arab	Central India, Bhind, Morena (Wynter-Blyth,1957)
29.	*Colotis vestalis vestalis* (Butler)	White Arab	Central India, Mandsaur, Nimar (Wynter-Blyth,1957)
30.	*Pareronia valeria hippie* (Fabricius)	Common Wanderer	Balaghat, Dhar, Indore Jabalpur, Mandla, Panna, Umaria (Choudhary & Khan,2002; Singh,2004), Indore (Pawar *et al.*,2017), Bhopal (Harsh,2014), Kanha-Pench corridor (Sharma *et al.*,2014)
31.	*Pareronia ceylanica ceylanica*	Dark Wanderer	Mandsaur, Ujjain (unpublished data)

32.	*Catopsilia pomona* (Fabricius)	Lemon or Common Emigrant	Balaghat, Bhind, Chhindwara, Chhatarpur, Dhar, Gwalior, Hoshangabad, Indore, Jabalpur, Jhabua, Mandla, Morena, Panna, Ratlam, Sagar, Seoni, Shahdol, Sidhi, Shivpuri, Tikamgarh, Ujjain, Umaria (Chandra *et al.*,2000a, b; Chandra *et al.*,2002; Choudhary & Khan,2002), Indore (Pawar *et al.*,2017), Ujjain (Kesharwani & Shukla,2016), Kanha-Pench corridor (Sharma *et al.*,) 2014) Betul (Bhowate *et al.,*2020) Bhopal (Mishra *et al.,*2014, Harsh,2014), Shahdol (Maini *et al.*,2017)
33.	*Catopsilia pyranthe pyranthe* (Linn.)	Mottled Emigrant	Balaghat, Bhind, Bhopal, Chhatarpur, Chhindwara, Hoshangabad, Indore, Jabalpur, Mandla, Sidhi, Umaria (Chandra *et al.*,2000a,b; Chandra *et al.,* 2002; Choudhary & Khan,2002.) Indore (Pawar *et al.*,2017), Kanha-Pench corridor (Sharma *et al.*,2014), Ujjain (Shouche *et al.*,2015), Betul (Bhowate *et al.*,2020), Bhopal (Harsh,2014)
34.	*Terias hecabe simulata* (Moore)	Common Grass Yellow	Balaghat, Betul, Bhind, Chhatarpur, Chhindwara, Damoh, Datia, Dhar, Gwalior, Jabalpur, Jhabua, Mandla, Mandsaur, Panna, Sidhi, Umaria (Siddiqui & Singh,2004; Choudhary & Khan,2002; Chandra *et al.*,2000a,b), Shahdol (Maini *et al.*,2017), Indore (Pawar *et al.*,2017 Kanha-Pench corridor (Sharma *et al.*,2014), Ujjain (Shouche *et al.*,2015), Betul (Bhowate *et al.*,2020), Bhopal (Mishra *et al.*,2014; Harsh,2014), Ujjain (Kesharwani & Shukla,2016)
35.	*Terias laeta laeta* (Boisduval)	Spotless Grass Yellow	Dhar, Jabalpur, Jhabua, Morena,Sagar, Sidhi, Umaria (Chandra *et al.*,2002 a,b; Chandra *et al.*,2002; Choudhary & Khan, 2002); Kanha-Pench corridor (Sharma *et al.*,2014), Bhopal (Harsh,2014)
36.	*Terias brigitta rubella* (Wallace)	Small Grass Yellow	Balaghat, Dhar, Hoshangabad, Jabalpur, Jhabua, Seoni, Umaria (Chandra *et al.*,2000b; Chandra *et al.*,2002; Choudhary & Khan,2002), Bhopal (Harsh,2014), Kanha-Pench corridor (Sharma *et al.*,2014)
37.	*Terias andersoni* Moore	One Spot Grass Yellow	Umaria (Choudhary & Khan,2002.)
38.	*Eurema blanda*	Three Spot Grass Yellow	Betul (Bhowate *et al.*,2020)
	Family: Danaidae		
39.	*Danaus chrysippus* (Linn)	Common Tiger	Balaghat, Betul, Bhind, Chhatarpur, Chhindwara, Damoh, Dhar, Gwalior Indore, Jabalpur, Jhabua, Khargaon, Mandla, Mandsaur, Morena, Panna, Ratlam, Sagar, Seoni, Shivpuri, Sidhi, Tikamgarh, Ujjain, Umaria (Chandra *et al.*,2000a,b; Chandra *et al.*,2002; Choudhary & Khan,2002), Indore (Pawar *et al.*,2017), Kanha-Pench corridor (Sharma *et al.*,2014), Betul (Bhowate *et.al.*,2020), Ujjain (Shouche *et al.*,2015; Kesharwani & Shukla,2016), Bhopal (Mishra *et al.*,2014), Shahdol (Maini *et al.*,2017)
40.	*Danaus genutia* (Cramer)	Striped Tiger	Bhopal, Balaghat, Chhatarpur, Chhindwara, Gwalior, Hoshangabad, Jabalpur, Jhabua, Mandla, Mandsaur, Sagar, Seoni, Shahdol, Shivpuri, Sidhi, Tikamgarh, Ujjain, Umaria(Chandra *et al.*,2000a; Chandra *et al.*, 2002;Choudhary & Khan,2002), Kanha-Pench corridor (Sharma *et al.*, 2014), Ujjain (Shouche *et al.*,2015), Betul (Bhowate *et al.*,2020), Bhopal (Harsh,2014), Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla, 2016)
41.	*Tirumala limniace leopardus* (Butler)	Blue Tiger	Balaghat, Bhopal, Dhar, Hoshangabad, Indore, Jhabua, Mandla, Panna, Seoni, Umaria (Chandra *et al.*,2000b; Chandra *et al.*,2002; Choudhary & Khan,2002), Indore (Pawar *et al.*,2017), Ujjain (Shouche *et al.*,2015), Betul (Bhowate *et al.*,2020), Bhopal (Mishra *et al.*,2014), Bhopal (Harsh,2014)
42.	*Parantica aglea*	Blue glassy tiger	Kanha-Pench corridor (Sharma *et al.*,2014), Bhopal (Harsh,2014), Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla,2016)
43.	*Parantica agleoides*	Dark glassy tiger	Kanha-Pench corridor (Sharma *et al.*,2014)
44.	*Euploea core core* (Cramer)	Common Indian Crow	Balaghat, Bhind, Chhindwara, Dhar, Indore, Jabalpur, Jhabua, Mandla, Morena, Seoni, Shivpuri, Sidhi, Sihore, Umaria (Chandra *et al.*,2000a,b; Chandra *et al.*,2002; Choudhary & Khan,2002), Kanha-Pench corridor (Sharma *et al.*,2014), Ujjain (Shouche *et al.*,2015), Betul (Bhowate *et al.*, 2020), Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla,2016)
	Family : Satyridae		
45.	*Melanitis leda ismene* (Cramer)	Common Evening Brown	Balaghat, Chhatarpur, Jabalpur, Mandla, Mandsaur, Morena, Ratlam, Seoni, Sidhi, Tikamgarh, Ujjain, Umaria (Chandra *et al.*, 2000a,b; Chandra *et al.*, 2002; Choudhary & Khan,2002), Kanha-Pench corridor (Sharma *et al.*,2014) Ujjain (Shouche *et al.*,2015), Betul (Bhowate *et al.*,2020), Bhopal (Mishra *et al.*,2014), Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla,2016)

46.	*Melanitis phedima bethami* de Niceville	Dark Evening Brown	Balaghat, Hoshangabad (Choudhary & Khan,2002), Kanha-Pench corridor (Sharma *et al.*,2014), Bhopal (Mishra *et al.*,2014)
47.	*Melanitis phedima varaha* Moore	Dark Evening Brown	Hoshangabad (Larsen,1988)
48	*Elymnias hypermnestra* undularis (Drury)	Common Palmfly	Kanha-Pench corridor (Sharma *et al.*,2014)
49.	*Lethe rohria* (Fabricius)	Common Tree Brown	Balaghat, Hoshangabad, Mandla, Panna, Umaria (Siddiqui & Singh,2004; Choudhary & Khan,2002; Chandra *et al.*,2000b)
50.	*Lethe europa europa* (Fabricius)	Bamboo Tree	Balaghat, Hoshangabad, Mandla, Umaria (Chandra *et al.*,2000b; Choudhary (Brown & Khan,2002)
51.	*Mycalesis lepcha bethami*	Lepcha Bush Brown	Hoshangabad (Evans,1932)
52.	*Mycalesis mineus* (Linn.)	Dark Branded Bush Brown	Hoshangabad, Seoni (Chandra *et al.*,2000b; 2002), Betul (Bhowate *et al.*, 2020)
53.	*Mycalesis pereus tabitha* (Fabricius)	Common Bush Brown	Hoshangabad, Panna (Chandra *et al.*,2000b; Siddiqui & Singh, 2004), Kanha-Pench corridor (Sharma *et al.*,2014)
54.	*Mycalesis visala visala* Moore	Long brand-Bush Brown	Hoshangabad, Panna (Siddiqui & Singh,2004; Betham,1890-91), Kanha-Kanha-Pench corridor (Sharma *et al.*,2014)
55.	*Orsotriaena medus medus* (Fabricius)	Nigger	Bastar, Dantewara (Gupta & Shukla,1987; Singh &Chandra,2002; Chandra, 2006)
56.	*Ypthima asterope* (Klug)	Common Three Ring	Balaghat, Hoshangabad, Mandla, Nimar, Seoni, Umaria (Witt,1909; Chandra *et al.*,2000b;Choudhary & Khan,2002), Kanha-Pench corridor (Sharma *et al.*,2014)
57.	*Ypthima huebneri* Kirby	Common Four ring	Balaghat, Hoshangabad, Mandla, Umaria (Chandra *et al.*,2000b; Choudhary & Khan,2002)
58.	*Ypthima baldus satpura* Evans	Common Five ring	Hoshangabad (Evans,1932), Umaria (Choudhary & Khan,2002), Kanha-Pench corridor (Sharma *et al.*,2014)
59.	*Ypthima ceylonica ceylonica* Hewitson	White or Ceylon Fourring	Hoshangabad (Chandra *et al.*,2000b)
60.	*Ypthima inica* Hewitson	Lesser Three-ring	Hoshangabad (Chandra *et al.*,2000b)
61.	*Ypthima lisandra striata* Hampson	Jewel Fourring	M.P. (Larsen,1988; Wynter-Blyth,1957)

Family: Nymphalidae

62.	*Ariadne merione* (Cramer)	Castor	Panna (Siddiqui & Singh,2004), Umaria (Choudhary & Khan,2002), Indore (Pawar *et al.*,2017), Ujjain (Kesharwani & Shukla,2016), Ujjain (Shouche *et al.*,2015), Betul (Bhowate *et al.*,2020), Shahdol (Maini *et al.*, 2017),
63.	*Byblia ilithyia* Drury	Joker	Nimar (Witt,1909; Wynter-Blyth,1957)
64.	*Argyreus hyperbius hyperbius* Drury	Indian Fritillary	Hoshangabad (Chandra *et al.*,2000b)
65.	*Phalanta phalantha* (Drury)	Common Leopard	Balaghat, Bhopal, Chhattarpur, Hoshangabad, Jabalpur, Mandla, Seoni, Shahdol, Shivpuri, Sidhi, Umaria (Chandra *et al.*,2000a; Chandra *et al.*, 2002; Choudhary & Khan,2002) Indore (Pawar *et al.*,2017), Kanha-Pench corridor (Sharma *et al.*,2014), Ujjain (Shouche *et al.*,2015), Betul (Bhowate *et al.*,2020)
66.	*Cynthia cardui* (Linn.)	Painted Lady	Balaghat, Mandla, Seoni, Shivpuri, Umaria (Chandra *et al.*,2002; Choudhary & Khan,2002), Kanha-Pench corridor (Sharma *et al.*,2014)
67.	*Precis iphita pluviatilis* Fruhstorfer	Chocolate Pansy	Balaghat, Chhindwara, Hoshangabad, Jabalpur Mandla, Panna, Umaria (Siddiqui & Singh,2004;Choudhary & Khan,2002), Indore (Pawar *et al.*, 2017), Kanha-Pench corridor (Sharma *et al.*,2014)
68.	*Junonia atlites* (Linn.)	Grey Pansy	Balaghat, Bhopal, Chhindwara, Jabalpur, Mandla, Panna, Seoni, Umaria (Siddiqui & Singh,2004; Chandra *et al.*,2002; Choudhary & Khan,2002), Indore (Pawar *et al.*,2017) Kanha-Pench corridor (Sharma *et al.*,2014), Betul (Bhowate *et al.*,2020)
69.	*Junonia almana almana* (Linn.)	Peacock Pansy	Balaghat, Chhindwara, Jabalpur, Mandla, Morena, Panna, Seoni, Shahdol, Shivpuri, Umaria (Siddiqui & Singh,2004; Chandra *et al.*,2002; Choudhary & Khan,2002), Indore (Pawar *et al.*,2017), Ujjain (Shouche *et al.*,2015), Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla, 2016)
70.	*Junonia hierta hierta* (Fabricius)	Yellow Pansy	Balaghat, Bhopal, Hoshangabad, Jabalpur, Mandla, Panna, Seoni, Umaria (Siddiqui & Singh,2004; Chandra *et al.*,2002; Choudhary & Khan,2002), Indore (Pawar *et al.*,2017), Kanha-Pench corridor, (Sharma *et al.*,2014) Ujjain (Shouche *et al,*,2015), Betul (Bhowate *et al.*,2020)
71.	*Junonia orithya swinhoei* Butler	Blue Pansy	Balaghat, Bhind, Bhopal, Chhattarpur, Hoshangabad, Jabalpur, Mandla, Morena, Panna, Seoni, Shivpuri, Sidhi, Tikamgarh, Ujjain, Umaria

			(Siddiqui & Singh,2004; Chandra *et al.*,2002; Choudhary & Khan, 2002; Chandra *et al.*,2000a), Indore (Pawar *et al.*,2017), Kanha-Pench corridor (Sharma *et al.*,2014),Ujjain(Shouche *et al.*,2015), Betul (Bhowate *et al.*, 2020), Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla,2016)
72.	*Junonia lemonias vaisya* (Fruhstorfer)	Lemon Pansy	Balaghat, Bhind, Bhopal, Chhattarpur, Hoshangabad, Jabalpur, Mandla, Mandsaur, Panna, Seoni, Shivpuri, Sidhi, Tikamgarh, Ujjain, Umaria (Siddiqui & Singh,2004; Chandra *et al.*,2002; Choudhary & Khan,2002; Chandra *et al.*,2000a,b), Indore (Pawar *et al.*,2017), Kanha-Pench corridor (Sharma *et al.*,2014), Ujjain (Shouche *et al.*,2015), Betul (Bhowate *et al.*, 2020), Bhopal(Mishra *et al.*,2014), Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla,2016)
73.	*Kallima inachus huegeli* (Kollar)	Orange Oakleaf	Hoshangabad, Panna, Umaria (Chandra *et al.*,2000b; Choudhary & Khan, 2002; Siddiqui & Singh,2004)
74.	Hypolimnas bolina (Linn.)	Great Eggfly	Balaghat, Bhopal, Chhindwara, Indore, Jabalpur, Bastar, Bilaspur, Koria, Sarguja, Mandla, Ratlam, Seoni, Shahdol, Shivpuri, Umaria (Gupta & Shukla,1987; Singh & (Chandra *et al.*,2002; Choudhary & Khan,2002), Cha Chandra,2002; Chandra,2006), Indore (Pawar *et al.*,2017) Kanha Pench corridor (Sharma *et al.*,2014), Ujjain (Shouche *et al.*,2015), Betul (Bhowate *et al.*,2020) Bhopalb (Mishra *et al.*,2014)
75.	*Hypolimnas misippus* (Linn.)	Danaid Eggfly	Balaghat, Bhind, Bhopal, Chhatarpur, Chhindwara, Bastar, Bilaspur, Jashpur, Raigarh, Hoshangabad, Indore, Jabalpur, Jhabua, Mandla, Mandsaur, Morena, Panna, Ratlam, Seoni, Shahdol, Shivpuri, Sidhi, Tikamgarh, Ujjain, Umaria (Chandra *et al.*,2000a,b; Chandra et al.,2002; Choudhary & Khan,2002; Siddiqui & Singh,2004) Indore (Pawar et al., 2017), Kanha-Pench corridor (Sharma *et al.*,2014), Ujjain (Shouche *et al.*, 2015), Betul(Bhowate *et al.*,2020), Bhopal (Mishra *et al.*,2014)
76.	*Neptis hylas astola* Moore	Common Sailer	Balaghat, Chhindwara, Hoshangabad, Jabalpur, Mandla, Panna, Shahdol, Umaria (Siddiqui & Singh,2004; Choudhary & Khan,2002; Chandra *et al.*, 2000b), Indore (Pawar *et al.*,2017), Kanha-Pench corridor (Sharma *et al.*, 2014), Betul (Bhowate *et al.*,2020), Bhopal (Mishra *et al.*,2014)
77.	*Neptis jumbah* Moore	Chestnut-streaked Sailer	Balaghat, Hoshangabad, Mandla (Chandra *et al.*,2000b; Choudhary & Khan,2002)
78.	*Neptis nandina hampsoni* Moore	Clear Sailer	M.P. (Larsen,1988)
79.	*Neptis soma* Moore	Sullied Sailer	Balaghat, Jabalpur, Mandla (Choudhary & Khan,2002)
80.	*Phaedyma collumella* (Cramer)	Short Banded Sailer	Balaghat, Hoshangabad, Mandla, Umaria (Chandra *et al.*,2000b; Choudhary & Khan,2002)
81.	*Athyma selenophora* (Kollar)	Staff Sergeant	Balaghat, Mandla, Umaria (Choudhary & Khan,2002)
82.	*Athyma perius* (Linn.)	Common Sergeant	Chhindwara, Hoshangabad, Panna, Umaria (Siddiqui & Singh,2004; Choudhary & Khan,2002; Chandra *et al.*,2000b), Betul (Bhowate *et al*., 2020)
83.	*Moduza procris procris* (Cramer)	Commander	Balaghat, Mandla, Panna, Umaria (Choudhary & Khan,2002; Siddiqui & Singh,2004), Kanha-Pench corridor (Sharma *et al*.,2014)
84.	*Tanaecia lepidea* (Butler)	Grey Count	Balaghat, Mandla, (Choudhary & Khan,2002)
85.	*Symphaedra nais* (Forster)	Baronet	Balaghat, Chhindwara, Jabalpur, Mandla, Panna, Seoni, Sidhi, Shahdol, Umaria (Siddiqui & Singh,2004; Choudhary & Khan,2002; Chandra *et al.*, 2000), Indore (Pawar *et al.*,2017), Kanha-Pench corridor (Sharma *et al.*, 2014)
86.	*Euthalia aconthea garuda* (Moore)	Common Baron	Balaghat, Mandla, Panna, Umaria (Siddiqui & Singh, 2004; Choudhary & Khan,2002), Indore (Pawar *et al.*,2017), Betul (Bhowate *et al.*,2020)
87.	*Euthalia lubentina* (Cramer)	Gaudy Baron	Balaghat, Mandla, Umaria (Choudhary & Khan,2002)
88.	*Polyura athamas* (Drury)	Common Nawab	Indore, Nimar (Witt,1909; Wynter-Blyth,1957)
89.	*Charaxes bernardus* Fabricius	Tawny Rajah	Balaghat, Mandla, Umaria (Choudhary & Khan,2002)
90.	*Charaxes solon* Fabricius	Black Rajah	Balaghat, Mandla, Panna, Umaria (Choudhary & Khan,2002; Siddiqui & Singh,2004)
91.	*Acraea terpsicore* (Linn)	Tawny Coster	Balaghat, Bhopal, Chhattarpur, Chhindwara, Hoshangabad, Jabalpur, Mandla, Panna, Seoni, Tikamgarh, Ujjain, Umaria (Chandra *et al.*,2000b; Choudhary & Khan,2002; Chandra et al.,2002; Siddiqui & Singh,2004) Indore (Pawar *et al.*,2017), Kanha-Pench corridor (Sharma *et al.*,2014), Betul (Bhowate *et al.*,2020)
Family : Riodinidae			
92.	*Abisara echerius suffusa* Moore	Plum Judy	Balaghat, Hoshangabad, Nimar, Chhindwara, Mandla, Umaria (Witt,1909; Chandra *et al.*,2000b; Choudhary & Khan,2002), Kanha-Pench corridor (Sharma *et al.*,2014)

Family : Lycaenidae

93. *Curetis bulis* Westwood	Bright Sunbeam	Hoshangabad (Betham,1890-91; Wynter-Blyth,1957)
94. Curetis dentata dentata Moore	Toothed Sunbeam	Hoshangabad, Panna (deNiceville,1890; Evans,1932; Siddiqui & Singh, 2004)
95. *Curetis thetis thetis* (Drury)	Indian Sunbeam	Hoshangabad (Betham,1890-91)
96. *Prosotas noreia* Felder	White-Tipped Line Blue	Umaria (Choudhary & Khan,2002)
97. *Jamides bochus bochus* (Cramer)	Dark Cerulean	Nimar (Witt,1909; Betham,1890-91)
98. *Jamides celeno aelianus* (Fabricius)	Common Cerulean	Balaghat, Hoshangabad, Mandla, Panna, Umaria (Siddiqui & Singh,2004; Choudhary & Khan,2002; Chandra,2000b), Kanha-Pench corridor (Sharma *et al.*,2014), Betul (Bhowate *et al.*,2020), Bhopal (Harsh,2014)
99. *Catochrysops strabo strabo* (Fabricius)	Forget-Me-Not	Seoni, Sidhi (Chandra *et al.*,2000a,2002) Kanha-Pench corridor (Sharma *et al.*,2014), Bhopal (Mishra *et al.*,2014; Harsh,2014)
100. *Lampides boeticus* (Linn.)	Pea Blue	Balaghat, Mandla, Panna, Sidhi, Umaria (Siddiqui & Singh,2004; Choudhary & Khan,2002; Chandra *et al.*,2000), Betul (Bhowate *et al.*,2020)
101. *Leptotes plinius* (Fabricius)	Zebra Blue	Balaghat, Mandla, Panna (Siddiqui & Singh,2004); Umaria (Choudhary & Khan,2002), Indore (Pawar *et al.*,2017), Kanha-Pench corridor (Sharma *et al.*,2014), Bhopal (Harsh,2014)
102. *Deudorix isocrates*	Guava blue	Bhopal (Harsh,2014)
103. *Castalius rosimon rosimon* (Fabricius)	Common Pierrot	Balaghat, Hoshangabad, Mandla, Panna, Seoni, Sidhi, Umaria (Chandra *et al.,*2000a,b; Choudhary & Khan,2002; Chandra *et al.*,2002; Siddiqui & Singh,2004), Indore (Pawar *et al.*,2017), Kanha-Pench corridor (Sharma *et al.*,2014), Bhopal (Mishra *et al.*,2014), Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla,2016)
104. *Tarucus nara*	Dark/striped Pierrot	Kanha-Pench corridor (Sharma *et al.*,2014), Ujjain (Shouche *et al.*,2015) Bhopal (Harsh,2014)
105. *Tarucus nara* (Kollar)	Rounded Pierrot	Balaghat, Indore, Jabalpur, Mandla, Panna, Umaria (Choudhary & Khan, 2002; Siddiqui & Singh,2004), Kanha-Pench corridor (Sharma *et al.*, 2014), Bhopal (Harsh,2014)
106. *Tarucus balkanica nigra* (Bethune-Baker)	Black Spotted Pierrot	M.P. (Gupta,1997)
107. *Zizeeria knysna karsandra* (Moore)	Dark Grass Blue	Umaria (Choudhary & Khan,2002), Bhopal (Harsh,2014)
108. *Zizina otis sangra* (Moore)	Lesser Grass Blue	Indore, Umaria (Evans,1932; Choudhary & Khan, 2002), Kanha-Pench corridor (Sharma *et al.*,2014), Ujjain (Shouche *et al.*,2015), Bhopal (Harsh,2014)
109. *Pseudozizeeria maha* (Kollar)	Pale Grass Blue	Balaghat, Indore, Mandla, Panna, (Siddiqui & Singh,2004), Umaria (Choudhary & Khan,2002), Indore (Pawar *et al.*,2017) Kanha-Pench corridor (Sharma *et al.*,2014), Bhopal (Harsh,2014), Shahdol (Maini *et al.*, 2017), Ujjain (Kesharwani & Shukla,2016)
110. *Chilades trochylus*	Small Grass Jewel	Indore (Pawar *et al.*,2017)
111. *Freyeria putli*	Oriental Grass Jewel	Ujjain (Shouche et al.,2015)
112. *Arthopala bazalus*	powdered oakblue	Ujjain (Shouche *et al.*,2015)
113. *Tajuria cippus*	Royal peacock	Indore (Pawar *et al.*,2017)
114. *Zizula hylax* Fabricius	Tiny Grass Blue	Umaria (Choudhary & Khan,2002) Kanha-Pench corridor (Sharma *et al.*, 2014), Bhopal (Harsh,2014)
115. *Everes lacturnus* Godart	Indian Cupid	Umaria (Choudhary & Khan,2002), Kanha-Pench corridor (Sharma *et al.*,2014)
116. *Talicada nyseus* Guerin Meneville	The Red Pierrot	Umaria (Choudhary & Khan, 2002), Indore (Pawar *et al.*,2017)
117. *Azanus ubaldus* Stoll	Bright Babul Blue	Indore (Betham,1890-91)
118. *Azanus uranus* Butler	Dull Babul Blue	Central India (Evans,1932)
119. *Celastrina lavendularis puspa* (Moore)	Plain Hedge Blue	M.P. (Wynter-Blyth,1957)
120. *Acytolepis lilacea* Hampson	Hampson's Hedge Blue	Hoshangabad (Betham,1890-91)
121. *Acytolepis puspa* Horsfield	Common Hedge Blue	Hoshangabad (Betham,1890-91)
122. *Euchrysops cnejus* (Fabricius)	Gram Blue	Balaghat, Indore, Mandla Nimar, Panna, Umaria (Witt,1909; Choudhary & Khan,2002; Siddiqui & Singh,2004), Kanha-Pench corridor (Sharma *et al.,* 2014), Bhopal (Harsh,2014)
123. *Chilades laius laius* (Cramer)	Lime Blue	Umaria (Choudhary & Khan,2002), Indore (Pawar *et al.*,2017) Kanha Pench corridor (Sharma et al.,2014), Bhopal (Harsh,2014)
124. *Chilades parrhasius* (Fabricius)	Small Cupid	Indore (Evans,1932), Kanha-Pench corridor (Sharma *et al.*,2014), Ujjain (Shouche *et al.*,2015), Bhopal (Harsh,2014)

125. *Chilades pandava* (Horsfield)	Plains Cupid	Nimar, Seoni (Witt,1909; Chandra *et al.*,2002), Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla,2016)
126. *Freyeria trochilus putli* (Kollar)	Grass Jewel	Umaria (Choudhary & Khan,2002)
127. *Spindasis vulcanus vulcanus* Fabricius	Common Silverline	Balaghat, Mandla, Panna, (Siddiqui & Singh,2004), Umaria (Choudhary & Khan,2002)
128. *Spindasis ictis ictis* (Hewitson)	Shot Silverline	Sidhi (Chandra *et al.*,2000), Umaria (Choudhary & Khan,2002)
129. *Spindasis elima elima* (Moore)	Scarce Shot Silverline	Umaria (Choudhary & Khan,2002)
130. *Narathura amantes* Hewitson	Large Oakblue	Balaghat, Indore, Mandla, Umaria (Evans,1932; Choudhary & Khan,2002)
131. *Narathura atrax* Hewitson	Dark Broken-Band Oakblue	Hoshangabad (Betham,1890-91)
132. *Amblypodia anita* (Hewitson)	Leaf Blue	Balaghat, Mandla, Umaria (Choudhary & Khan,2002)
133. *Iraota timoleon timoleon* (Stoll)	Blue Silver Streak	Hoshangabad (Evans,1932)
134. *Loxura atymnuscontinentalis*	Yamfly	M.P. (Wynter-Blyth,1957)
135. *Pratapa deva* (Moore)	White Royal	M.P. (Gupta,1997; Wynter-Blyth,1957)
136. *Tajuria cippus* (Fabricius)	Peacock Royal	Chindwara, Hoshangabad, Seoni (Betham,1890-91; Chandra *et al.*,2000b)
137. *Tajuria jehana* Moore	Plains Blue Royal	Indore, Nimar (Witt,1909; de Niceville,1890)
138. *Virachola isocrates* (Fabricius)	Common Guava Blue	Hoshangabad, Sidhi, Umaria (Chandra *et al.*,2000a,b; Choudhary & Khan, 2002)
139. *Rapala iarbus* Fabricius	Indian Red Flash	Balaghat, Chhindwara, Hoshangabad, Jabalpur, Jhabua, Mandla, Panna, Seoni, Sidhi, Umaria (Chandra *et al.*,2000a,b; Chandra *et al.*,2002; Choudhary & Khan,2002; Siddiqui & Singh,2004)

Family : Hesperiidae

140. *Bibasis sena* Moore	Orange Tailed Awlet	Hoshangabad (Betham,1890-91)
141. *Hasora chromus* Cramer	Common Banded Awl	Balaghat, Mandla, Panna, Umaria (Siddiqui & Singh, 2004; Choudhary & Khan,2002), Kanha-Pench corridor (Sharma *et al.*,2014), Ujjain (Shouche *et al.*,2015), Betul (Bhowate *et al.*,2020), Bhopal (Harsh,2014)
142. *Badamia exclamationis* (Fabricius)	Brown Awl	Sidhi, Umaria (Chandra *et al.*,2000; Choudhary & Khan,2002)
143. *Celaenorrhinus ambareesa* (Moore)	Malabar Flat	Balaghat, Hoshangabad, Mandla, Umaria (Chandra *et al.*,2000b; Choudhary & Khan,2002), Kanha-Pench corridor (Sharma *et al.*,2014), Bhopal (Harsh, 2014)
144. *Celaenorrhinus leucocera* (Kollar)	Common Spotted Flat	M.P. (Ghosh & Chaudhury,1997)
145. *Coladenia indrani* (Moore)	Tricolour Pied Flat	Nimar (Witt,1909; Betham,1890-91), Kanha-Pench corridor (Sharma *et al.,* ,2014), Bhopal (Harsh,2014)
146. *Sarangesa purendra* (Moore)	Spotted Small Flat	Umaria (Choudhary & Khan,2002) Bhopal (Harsh,2014)
147. *Sarangesa dasahara* (Moore)	Common Small Flat	Umaria (Choudhary & Khan,2002)
148. *Gerosis bhagava* (Moore)	Common Yellow-breast Flat	Hoshangabad (Betham,1890-91; Chandra *et al.*,2000b)
149. *Tagiades japetus atticus* (Fabricius)	Suffused Snow Flat	M.P. (Wynter-Blyth,1957)
150. *Odontoptilum ransonnettii* (R. Felder)	Golden Angle	Umaria (Choudhary & Khan,2002.)
151. *Spialia galba* (Fabricius)	Indian Skipper	Balaghat, Mandla, Umaria (Choudhary & Khan,2002), Kanha-Pench corridor (Sharma *et al.*,2014), Bhopal (Mishra *et al.*,2014), (Harsh,2014)
152. *Arnetta vindhiana* Moore	Vindhyan Bob	Indore (Wynter-Blyth,1957)
153. *Udaspes folus* (Cramer)	Grass Demon	Panna, Umaria (Siddiqui & Singh,2004; Choudhary & Khan,2002)
154. *Telicota ancilla bambusae* (Moore)	Dark Palm Dart	Balaghat, Hoshangabad, Mandla, Panna, Seoni, Umaria (Siddiqui & Singh, 2004; Choudhary & Khan,2002; Chandra *et al.*,2002; Chandra *et al.*,2000)
155. *Telicota colon*	Pale palm dart	Betul (Bhowate *et al.*,2020)
156. *Pelopidas mathias mathias* (Fabricius)	Small Branded Swift	Balaghat, Hoshangabad, Mandla, Panna, Seoni, Sidhi, Umaria (Siddiqui & Singh,2004; Choudhary & Khan,2002; Chandra *et al.*,2002; Chandra *et al.,* 2000a,b), Kanha-Pench corridor (Sharma *et al.*,2014), Betul (Bhowate *et al.*,2020), Bhopal (Harsh,2014), Shahdol (Maini *et al.*,2017), Ujjain (Kesharwani & Shukla,2016)
157. *Pelopidas assamensis* (Wood-Mason & de Niceville)	Great Swift	M.P. (Wynter-Blyth,1957)
158. *Suastus gremius* (Fabricius)	Indian Palm Bob	Balaghat, Mandla, Umaria (Choudhary & Khan,2002)
159. *Taractrocera maevius* (Fabricius)	Common Grass Dart	M.P. (Ghosh & Chaudhury,1997)
160. *Potanthus confucius* (Felder)	Tropic Dart	M.P. (Ghosh & Chaudhury,1997)
161. *Potanthus pseudomaesa* Moore	Common Dart	Central Provinces (Evans,1932)
162. *Parnara naso bada* (Moore)	Straight Swift	Central India (Evans,1932; Ghosh & Chaudhary,1997)

163. *Baoris farri farri* (Moore)	Paintbrush Swift	Central India (Ghosh & Chaudhary,1997)
164. *Borbo cinnara* Walker	Rice Swift	Balaghat, Mandla, Seoni, Sidhi, Umaria (Chandra *et al.*,2000a; Choudhary & Khan,2002)
165. *Borbo bevani* Moore	Bevan's Swift	Indore, Nimar (Witt,1909;Wynter-Blyth,1957) Kanha-Pench corridor (Sharma *et al.*,2014), Bhopal (Harsh,2014)
166. *Matapa aria* (Moore)	Common Redeye	Sidhi, Umaria (Chandra *et al.*,2000a; Choudhary & Khan,2002)

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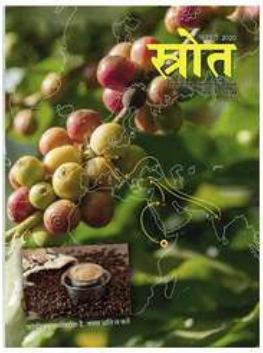

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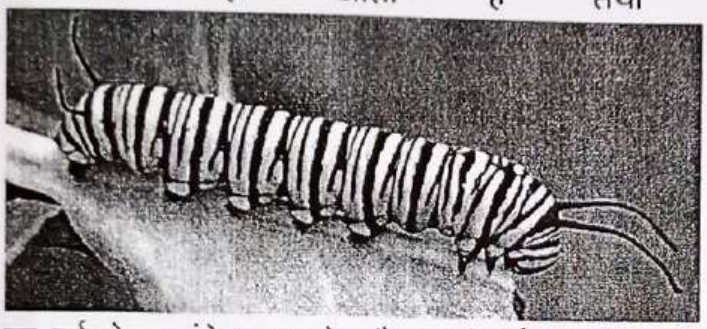
डॉ. विपुल कीर्ति शर्मा

ज़हर खाकर मोनार्क तितली कैसे ज़िंदा रहती है?

मेक्सिको और कैलिफोर्निया के आसपास मिल्कवीड पौधों की दो दर्जन प्रजातियां मिलती हैं जिन्हें पशु खाना पसंद नहीं करेंगे, चाहे भूखे मर जाएं। इन पौधों से निकलने वाले दूध में कार्डिनोलाइड्स नामक बेहद कड़वे एवं विषाक्त स्टेरॉइड पाए जाते हैं जिन्हें खाने से हृदय गति अनियंत्रित हो जाती है तथा उल्टियां होने लगती हैं।



हर वर्ष बेहद लंबे प्रवास के दौरान मोनार्क तितलियां इन्हीं मिल्कवीड पौधों पर अंडे देती हैं। अंडों से निकली पेटू इल्लियां (कैटरपिलर्स) पत्तियों के साथ विषाक्त दूध का भी सेवन करते हैं परंतु उनका कुछ नहीं बिगड़ता। ये कैटरपिलर्स विष को शरीर में एकत्रित करते रहते हैं। जब वे तितली में परिवर्तित हो जाते हैं तो यही विष तितली के शरीर में आ जाता है। तो सवाल उठता है कि आखिर कैटरपिलर्स और मोनार्क तितली इस अत्यंत प्रभावी विष को क्यों एकत्रित करके शरीर में रखती है और वे खुद इस विष के दुष्प्रभाव से कैसे बची रहती हैं? प्रकृति में तितलियों और कैटरपिलर्स के कई शिकारी पाए जाते हैं जो मौका मिलते ही उन्हें खा सकते हैं। विष को शरीर में एकत्रित करके रखने से शिकारी इन तितलियाों और उनकी इल्लियों को खाने से बचते हैं। शिकारियों से बचने का यह महत्वपूर्ण तरीका है।

कार्डिनोलाइड्स का काम

कार्डिनोलाइड्स मुख्य रूप से एस्क्लिपिएडेसी और एपोसायनेसी कुल के पौधों में पाए जाते है। पौधों में यह ज़हर पशुओं द्वारा खाए जाने से बचाव करता है। यह विष जंतु कोशिका की कोशिका झिल्ली में पाए जाने वाले महत्वपूर्ण प्रोटीन सोडियम-पोटेशियमपंप को प्रभावित करता है। कोशिकाओं में सोडियम तथा पोटेशियमआयन का स्तर निश्चित रहता है। सोडियम-पोटेशियमपंप इन आयनों की सांद्रता को बनाए रखने में मदद करते हैं। आयन की सामान्य सांद्रता से ही पेशियां तथा तंत्रिकाएं ठीक तरीके से कार्य कर पाती है। मिल्कवीड का विष सीधे सोडियम-पोटेशियमपंप से बंधकर सामान्य कामकाज में बाधा उत्पन्न करता है। विष के प्रभाव से हृदय की गति तेज़ होती जाती है और अंत में हृदय कार्य करना बंद कर देता है। हाल ही में नेचर पत्रिका में प्रकाशित शोध पत्र में वैज्ञानिकों ने बताया है कि किस प्रकार मोनार्क

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Butterfly Species Diversity and Abundance at Govt. Holkar Science College Campus, Indore

Rakesh Alone[1*], Dharmendra Jat[2]

[1]Department of Botany, Govt. Holkar Science College, Devi Ahilya Vishwavidhalaya, Indore, India
[2]Department of Seed Technology, Govt. Holkar Science College, Devi Ahilya Vishwavidhalaya, Indore, India

[*]*Corresponding Author: aloneguru.702@gmail.com*

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***Abstract*—**A study on butterfly was carried out at Holkar Science College Campus, Indore District, Madhya Pradesh, India, during 2020 to 2021. A total of 51 butterfly species were recorded. Family Nymphalidae (21) dominates in the study area, followed by Pieridae (11), Lycaenidae (11), Papilionidae (05) with minimum members of Hesperiidae (03). Total larval food plants recorded from the campus are 41 belonging to different families. *Hygrophylla aericulata* were found most importance larval food plants as they supports the five pansies found here. The ratio of food plants and butterflies is near about 1:1. Plants of the Asteraceae family were more used by butterflies as nectar food plants. These findings are important with respect to butterfly diversity and abundance in planning conservation strategies in the area. The very common butterflies are Common jezebel, Common gull, Common emigrant, Mottled emigrant, Common grass yellow, Red Pierrot, Common castor, Chocolate pansy, Pale grass blue, Small grass jewel, Lemon pansy, Great egg fly, Danaid egg fly, Plain tiger and among very rare includes Lesser gul, Baronet, Grey pansy, Spot swordtail, Royal peacock, Commander, and Common wanderer. The study area is rich in butterfly diversity and further research could be conducted to obtained more details and documentation on butterfly diversity and abundance for the conservation and butterfly park.

Keywords— Butterfly diversity , abundance, larval food plants, conservation, Asteraceae.

I. INTRODUCTION

Butterflies are good indicators of climatic conditions, seasonal and ecological changes, they can also serve in formulating strategies for conservation. They are the most attractive insects belonging to the phylum Arthropoda and order lepidoptera. They are useful in studies of population and community ecology (Pollard 1991)[1] as bioindicators of ecosystem health because they are very sensitive to changes in microclimate and habitat (Erhardt 1985; Kremen 1992)[2] [3].

The relationship between and given butterfly species and its host plant is very specific. Among all the resources required by butterflies that comprise a habitat (Dennis *et al.* 2003, 2006)[4] [5], the larval host plants are the key resource, being fundamental for reproduction. Therefore, it is necessary to know the exact needs of the immature stages to make conservation successful larval host plants is still poor in the case of many butterfly species, especially in the tropics (Kunte 2000)[6].

The present study was carries out with a view to examine the Diversity and Abundance of butterfly population with reference to larval host plants at Holkar Science College, Indore city, India.

II. RELATED WORK

Recently Sharma et. al. (2013)[7] reported about 70 species of butterflies from Omkareshwar region. They have reported only four pansies from that large area; however we have found all the six pansies in our campus. This again indicates the richness of flora of this campus from butterfly's diversity and abundance point of view.

III. METHODOLOGY

The findings presented here are based on a field survey and investigations carried out on a daily basis from July 2020 to November 2021 at around of Holkar Science College Campus, Indore. In the said investigation the selected sites were surveyed mainly between 7:00 am to 11:00 am and 3:00 pm to 5:00 pm. (Kunte 2000)[6].

IV. RESULTS AND DISCUSSION

Total 51 butterfly's species from 5 families are enlisted during the present study. Family wise, the numbers of species are Nymphalidae- 21; Pieridae- 11; Lycaenidae- 11; Papilionidae- 05; Hesperiidae- 03. Nymphalidae family dominates in the study area. Ixora, Jamaican spike, Snakeweed, Lantana, Zinnia, Cosmos, Peregrina mostly found to be used by butterflies as nectar food plants.

Table no:-1 Common name and frequencies of Butterflies at Holkar Science College Indore M.P.

S.N.	Common Name	Scientific Name	VC	C	R	VR
I. Family : PAPILIONIDAE						
1	Common Mormon	*Papilio polytes*		+		
2	Lime Butterfly	*Papilio demoleus*	+			
3	Tailed Jay	*Graphium Agamemnon*		+		
4	Common Jay	*Graphium sarpedon*			+	
5	Spot Swordtail	*Graphium nomius*				+
II. Family : PIERIDAE						
1	Common Jezebel	*Delis eucharis*	+			
2	Common Gull	*Cepora nerissa*	+			
3	Pioneer	*Anaphaeis aurota*		+		
4	White Orange Tip	*Ixias Marianne*			+	
5	Common Emigrant	*Catopsilia crocale Pomona*	+			
6	Mottled Emigrant	*Catopsilia pyranthe*	+			
7	Common Grass Yellow	*Eurema hecabe*	+			
8	Common Wanderer	*Pareronia valeria*				+
9	One Spots Grass Yellow	*Eurema andersonii*		+		
10	Spots Less Grass Yellow	*Eurema laeta*		+		
11	Lesser Gull	*Cepora nadina*				+
III. Family : LYCAENIDAE						
1	Red Pierrot	*Talicada nyseus*	+			
2	Common Pierrot	*Castalius rosimon*		+		
3	Lime Blue	*Chilades laius*			+	
4	Zebra Blue	*Tarucus plinius*		+		
5	Pale Grass Blue	*Pseudozizeeria maha*	+			
6	Small Grass Jewel	*Chilades trochylus*	+			
7	Royal Peacock	*Tajuria cippus*			+	
8	Gram Blue	*Euchrysops cnejus*		+		
9	Common Cerulean	*Jamides celeno*			+	
10	Lesser Grass Blue	*Zizina otis*		+		
11	Small Cupid	*Chiladas parrhasius*			+	
IV. Family : NYMPHALIDAE						
1	Common Castor	*Ariadne merione*	+			
2	Common Leopard	*Phalanta phalantha*			+	
3	Peacock Pansy	*Junonia almana*		+		
4	Lemon Pansy	*Junonia lemonias*	+			
5	Baronet	*Euthalia nais* Forst			+	
6	Blue Pansy	*Junonia orithya*			+	
7	Yellow Pansy	*Junonia hierta*		+		
8	Chocolate Pansy	*Junonia iphita*	+			
9	Great Eggfly	*Hypolimnas bolina*	+			
10	Tawny Coster	*Acraea violae*			+	
11	Common Sailor	*Neptis hylas*				+
12	Common Baron	*Euthalia aconthea*				+
13	Danaid Eggfly	*Hypolimnas misippus*	+			
14	Gray Pansy	*Junonia atlites*			+	
15	Plain Tiger	*Danaus chrysippus*	+			
16	Commander	*Moduza procris*			+	
17	Blue Tiger	*Tirumala limniace*			+	
18	Common Crow	*Euploea core*	+			
19	Common Evening Brown	*Melanitis leda*			+	
20	Dark Evening Brown	*Melanitis phedima*		+		
21	Common Tiger	*Danaus genutia*			+	
V. Family: HESPERIIDAE						
1	Common Banded Awl	*Hasora chromus*			+	
2	Brown Awl	*Badamia exclamationis*			+	
3	Small Branded Swift	*Pelopidas mathias*				+

Note:- Very Common (VC), Commom (C), Rare (R), and Very Rare (VR)

Table 2 List of Larval food plants recorded form Holkar Science College Campus. 2021

S.N.	Larval food plant	Common name	Name of Butterflies
1.	*Diospyros melanoxylon, Shorea robusta*	Tendu, Sal	Baronet
2.	*Justicia procumbens, Lepidogathis prostrata*	Justicia	Blue Pansy
3.	*Asclepias curassavica*	Blood flower	Blue Tiger
4.	*Terminalia belerica*	Behra	Brown Awl
5.	*Hygrophila auriculata,*	Talimkhana	Chocolate Pansy
6.	*Mussaenda frondosa, Mitrijyna parvifolia*	Mussaenda, Kadamb	Commander
7.	*Pongamia pinnata*	Karanj	Common Banded Awl
8.	*Mangifera indica*	Mango	Common Baron
9.	*Ricinus communis*	Arandi	Common Castor
10.	*Abrus precatorius*		Common Cerulean
11.	*Thevetia, Ficus racemosa, Ficus benghalensis, Carissa spinarum*	Kaner, Gular, Banyan, Jangali Karonda	Common Crow
12.	*Cassia fistula*	Amaltas	Common Emigrant
13.	*Oryza sativa, Heteropogon contortus*	Rice, Grasses	Common Evening Brown
14.	*Cassia tora, Caesalpinia pulcherrima*	Pawar, Peacock flower	Common Grass Yellow
15.	*Capparis zeylanica*	Capers	Common Gull
16.	*Polyalthia longifolia*	Ashok	Common Jay
17.	*Dendrophthoe falcata*	Mistletoe	Common Jezebel
18.	*Flacourtia montana*	Rnnantambut	Common Leopard
19.	*Aegle marmelos, Murraya koenigii, Citrus limon,Jasminum sambac*	Bael, Mitta Neem, Orange, Dud Mogara	Common Lime
20.	*Aegle marmels, Jasminum sambac*	Bael, Dud Mogara	Common Mormon
21.	*Ziziphus jujuba*	Ber	Common Pierrot
22.	*Salmalia malabarica*	Red silk cotton	Common Sailor
23.			Common Tiger
24.	*Maerua oblongifolia*	Capers	Common Wanderer, Common Gull
25.	*Portulaca oleracea*	Purslane	Danaid Egg fly
26.	*Ischaemum timorense, Digitaria didactyla*		Dark Evening Brown
27.	*Vigna trilobata*		Gram Blue
28.	*Hygrophila auriculata*	Talimkhana	Gray Pansy
29.	*Portulaca oleracea*	Purslane	Great Egg fly
30.	*Hygrophila auriculata*	Talimkhana	Lemon Pansy
31.	*Desmodium triflorum, Desmodium heterophyllum*		Lesser Grass Blue
32.			Lesser Gull
33.	*Citrus limetta*	Nimbu	Lime Blue
34.	*Cassia fistula, Cassia tora*	Amaltas	Mottled Emigrant
35.	*Ventilago goughii*		One Spots Grass Yellow
36.	*Oxalis corniculata*	Khatti Buti	Pale Grass Blue
37.	*Hygrophila auriculata*	Talimkhana	Peacock pansy
38.	*Capparis spinosa*	Capers	Pioneer
39.	*Calotropis procera, Calotropis gigantea*	Aak	Plain Tiger
40.	*Bryophyllum pinnatum*	Patthar chatta	Red Pierrot
41.			Royal Peacock
42.	*Heliotropium sp.*	Pea pods	Small Grass Jewel
43.	*Polyalthia cerasoides, Miliusa tomentosa*	Champak	Spot Swordtail
44.	*Chamaecrista auricoma*	Chuimui	Spots Less Grass Yellow
45.	*Annona squamosa, Polyalthia longifolia*	Sitaphal, Ashok	Tailed Jay
46.	*Passiflora foetida*	Passion flower	Tawny Coster
47.	*Capparis sp.*	Capers	White Orange Tip
48.	*Hygrophila auriculata*	Talimkhana	Yellow Pansy
49.	*Plumbago zeylanica*	Chitrak	Zebra Blue

Identification of the butterflies was primarily made directly in the field. In critical condition, specimens were collected only with handheld aerial sweep nets. The observed butterflies were grouped in four categories on the basis of number of sighting in the field. The butterflies were categorized as Very Common (VC), Commom (C), Rare (R), and Very Rare (VR) (Tiple *et al.* 2006, 2007)[8] [9].

V. CONCLUSION AND FUTURE SCOPE

The campus is rich and diversified with more than fourteen gardens and one developing Butterfly Park in the Department of Seed Technology. A large number of trees, shrubs and linas are growing here along with the large number of flowering plant, grass and sages. Thus the study region is abundant in nectar-containg flora and attractive blooming plants i.e. Ixora, Jamaican spike, Snakeweed, Lantana, Zinnia, Cosmos, Peregrina *Rosa indica, Hibiscus rosa sinensis, Nyctanthes arbor-tristis, Caesalpinia pulcherrima* etc. which encourage butterfly diversity and abundance, must be responsible for the newly discovered species. Some previously abundant known species now have been found rare in this investigation, while some new species have been discovered too. Its reason must be that All these factor are attributed to the rich diversity & abundance of butterflies here. The richness of butterflies clearly indicates the presences of a large number of larval food plants in college campus.

VI. ACKNOWLEDGMENT

The authors are grateful to The Principal, Govt. Holkar science college, Indore for providing facilities to carry out this investigation. The author's would like to thank Dr. Kishore Pawar for their moral support and guidance. Authors also very much thankful to Mr. Ritesh Khabia & Mr. Swapnil Phanse members of wild warriors NGO for their valuable support during conducting the study.

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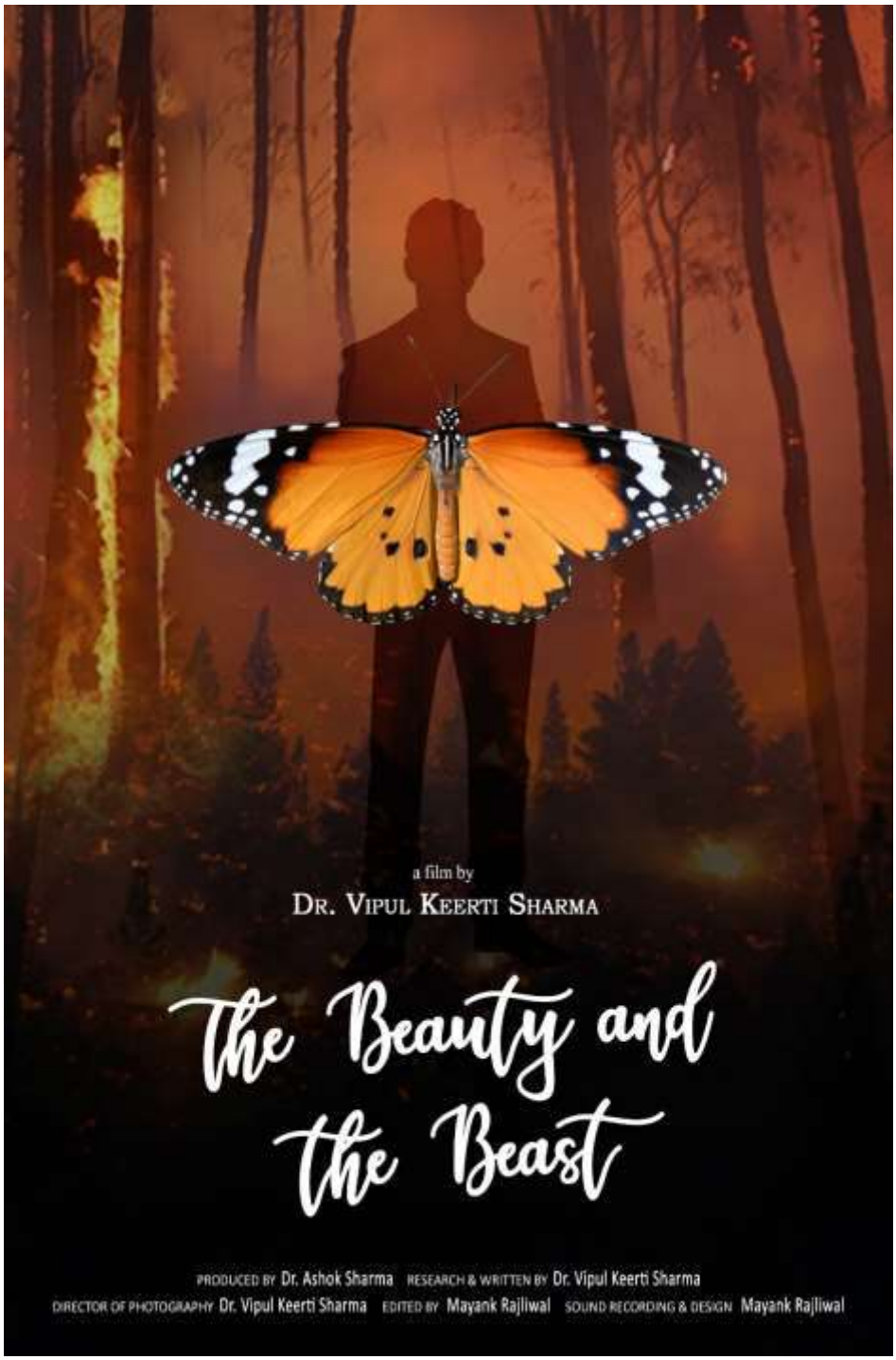
7.1.2. A: Evidence of Success

Poster of the Film



राष्ट्रीय उपलब्धि : तितलियों पर शहर के प्रोफेसर द्वारा बनाई गई साइंस फिल्म चुनी गई इंडियन साइंस फिल्म फेस्ट में

होलकर कॉलेज में बनाई फिल्म ब्यूटी एंड द बीस्ट, इंदौर की तितलियां व इंसान के लालच से उन्हें पहुंचता नुकसान दिखाया

सिटी रिपोर्टर, इंदौर

तितलियों की सुंदर रंगीन दुनिया, प्रकृति के साथ उनका रिश्ता और स्वार्थ में अंधे मनुष्य की निर्ममता... यह सब इस साइंस फिल्म 'ब्यूटी एंड द बीस्ट' में दिखाया गया है। इसमें तितलियों, मकड़ियों, चींटों को ब्यूटी और मनुष्य को बीस्ट (क्रूर, पाशविक प्राणी) के रूप में दिखाया गया है। शहर के प्रोफेसर विपुल कीर्ति शर्मा ने होलकर कॉलेज में फिल्माया है इसे। 29 मिनट की इस फिल्म की सिनेमेटोग्राफी, पोस्ट प्रोडक्शन और वॉइस ओवर भी उन्होंने ही किया है। इससे पहले 2018 में उनकी मकड़ियों पर बनी फिल्म प्रीडेटिंग द प्रीडेटर भी इस फिल्म फेस्ट के लिए चुनी गई थी।

तितलियों की दशा-दुर्दशा पर्यावरण की सेहत बताती है

तितलियों का प्रजनन, होस्ट प्लांट पर लार्वा देना, फिर उनका तितलियां बनना सब इस फिल्म में दिखाया गया है। साथ ही यह भी बताया कि मनुष्य के लालच और अंधाधुंध विकास के कारण जैव विविधता खतरे में पड़ गई है। प्रो. विपुल कहते हैं - तितलियों पर बनाई यह फिल्म बताती है कि तितलियों का संसार जितना भरा पूरा होगा, पर्यावरण भी उतना ही सेहतमंद होगा। इंदौर में 40 किस्म की तितलियां मिलती हैं।

दैनिक भास्कर इंदौर सिटी भास्कर 18-04-2022

विशेष | होलकर कॉलेज के पार्क में तितलियों की बहार, यहां पानी भरकर विकसित किया गया है 'मड पडलिंग'

तितली से जानें प्रदूषण का स्तर, जहां ज्यादा दिखें वहां आबोहवा अच्छी

सिटी रिपोर्टर . इंदौर

होलकर साइंस कॉलेज के बीज तकनीकी विभाग द्वारा विकसित बटरफ्लाई पार्क में इन दिनों तितलियों की बहार है। वजह है नेक्टर प्लांट्स और होस्ट प्लांट्स के साथ-साथ तितलियों के लिए 'मड पडलिंग' (तितलियों द्वारा तरल पदार्थों से पोषक तत्वों को चूसना) की जगह तैयार करना। यहां पार्क के कुछ हिस्सों में 3 से 4 दिन के अंतराल पर पानी भरकर 'मड पडलिंग' की जगह बनाई गई है। ये मौसम कई तितलियों के प्रजनन का समय भी है। प्रोफेसर भक्तेंद्र जाट बताते हैं कि तितलियां प्रदूषण की जैव सूचक (बायो इंडिकेटर) भी हैं। जहां की हवा प्रदूषित होगी वहां उनकी संख्या कम या न के बराबर होगी। यदि किसी स्थान पर तितलियां हैं तो वायु लेहिए वहां की आबोहवा स्वच्छ है।

वंश वृद्धि के लिए जरूरी मड पडलिंग, इससे नर तितली को मिलता है सोडियम, अमीनो एसिड

पार्क में अंडे देती टैनि कॉमन

प्रोफेसर भक्तेंद्र जाट बताते हैं कि सामान्यतः लगता है कि तितलियों की संख्या बढ़ाने के लिए पार्क या गार्डन में सिर्फ प्लांट्स की जरूरत होती है, लेकिन इसके साथ गार्डन में पानी भरकर कीचड़ वाला या नम क्षेत्र विकसित करना भी जरूरी है। तितलियों की जीवनचक्रण के लिए पोषक पदार्थ तो फूलों से मिल जाते हैं, परंतु वंश वृद्धि के लिए निषेचन के पश्चात अंडों का पूर्ण विकसित होना जरूरी है और अंडों के विकास के लिए मादा तितली को सोडियम एवं अमीनो एसिड चाहिए, जो नर तितली द्वारा मेटिंग (निषेचन) के दौरान मादा के शरीर में स्थानांतरित कर देते हैं। यह पोषण अंडों के जीवित रहने की दर भी बढ़ाता है।

क्या है मड पडलिंग

यह कुछ कीटों विशेषकर तितलियों द्वारा की जाने वाली क्रिया है। इसमें नर तितलियां कीचड़, नम रेत, नम मिट्टी और सड़ते हुए पौधों के तरल पदार्थों में पोषक तत्वों की तलाश कर उन्हें चूसती हैं, जिससे उन्हें सोडियम एवं अमिनो एसिड प्राप्त हो जाए।

जैव विविधता के लिए

- तितली पार्क में मड पडलिंग के लिए स्थान विकसित किया है। जैव विविधता को बनाए रखना बेहद जरूरी है। इसको लेकर हर्ष की बात है कि इस भीषण गर्मी में भी तितलियों को यहां देखने को मिल रही है।

- डॉ. सुरेश सिनगारट, प्राचार्य होलकर साइंस कॉलेज

पहल ● होलकर साइंस कॉलेज में बने बटरफ्लाय पार्क में तितलियों को रिझाने, उनका जीवन बढ़ाने के लिए होंगे रोचक प्रयोग

तितलियां गा सकें जिंदगी का 'अनहद', इसलिए छिड़केंगे शहद

इंदौर (नईदुनिया रिपोर्टर)। होलकर साइंस कॉलेज में बने बटरफ्लाय पार्क में कई नए आयाम जुड़ने जा रहे हैं। पार्क में तितलियों को आकर्षित करने और उनका जीवन चक्र बढ़ाने में मदद करने के लिए हनी स्प्रे तकनीक की मदद ली जाएगी। यह इसलिए किया जाएगा ताकि तितलियां पार्क में अपने जीवन में आनंद का अनहद राग गा सकें। तितलियों में दिलचस्पी रखने वालों को भी अब इस पार्क में नई सौगात हार्मोनियम के रूप में मिलेगी। बटरफ्लाय पार्क को बेहतर बनाने के लिए कई प्रयोग, बदलाव व सुविधाओं की तैयारी की जा रही है।

कॉलेज परिसर में वर्ष 2015-16 में बटरफ्लाय पार्क बना था। इस बार पार्क में जब तितलियों की कई प्रजातियों की संख्या अपेक्षाकृत नहीं हुई नजर आई तो संस्थान ने इसके विकास के लिए नई खोजबीन शुरू की। अब उन पर काम शुरू कर दिया है। यहां सबसे पहले तो तितलियों की संख्या व प्रजातियां बढ़ाने के लिए उनके होस्ट प्लांट्स लगाए जा रहे हैं। साथ ही होस्ट प्लांट्स के साथ फूलदार पौधे भी लगाए जा रहे हैं, जिनमें लेंटाना, पेडीलीलस, गैंदा, सूरजमुखी, कॉसमॉस आदि हैं। तितलियां पार्क से बाहर न जाएं इसलिए इसमें जाली भी लगाई जाएगी।

होलकर साइंस कॉलेज में तितलियों के संरक्षण और प्रजनन का सुरक्षित माहौल देने के लिए बटरफ्लाय पार्क बनाया गया है। ● नईदुनिया

लेमन पैंसी ● सौजन्य

रेड पायरेट ● सौजन्य

इसका फायदा तितलियों पर अध्ययन करने वालों को भी मिल सकेगा।

प्रभारी डॉ. सुरेश टी सिलावट और विभागाध्यक्ष डॉ. किसलय पंचोली के अनुसार पार्क में गत वर्ष की अपेक्षा इस वर्ष अधिक तितलियां नजर आ रही हैं। वर्तमान में यहां रेड पायरेट, लेमन पैंसी, कॉमन क्रो, रेल्ड जे आदि की संख्या में बढ़ोतरी हुई है। इस कार्य में प्रधानाध्यापक अशोक जाट, इंदर पाटीदार, गोविंद जाट व कन्हैयालाल मनोरिया की महती है। फिलहाल कोरोना संक्रमण के चलते विजिटर्स के आने पर तो प्रतिबंध है पर जब यह प्रतिबंध हटेगा तब तक संभवित रूप से उद्यान पहले से और भी बेहतर हो जाएगा।

पहले किया था शुगर स्प्रे

संस्थान के सचिव जाट ने बताया कि इस उद्यान को विकसित करने वाले संस्थान के पूर्व विभागाध्यक्ष डॉ. शिवाकर पंवार के साथ पूर्व में पौधों पर शक्कर के घोल का छिड़काव किया गया था। इस प्रयोग में यह देखा गया कि जहां यह हुआ था वहां तितलियां अपेक्षाकृत अधिक आकर्षित हुई थीं। इसी प्रयोग पर अमल करते हुए अब पौधों पर हनी स्प्रे किया जाएगा। इसमें पानी में शहद घोलकर पौधों पर छिड़काव किया जाएगा।

हार्मोनियम के जरिए होगा अध्ययन :

तितलियों पर अध्ययन करने वालों के लिए भी यहां कई प्रयास किए जा रहे हैं जिसमें से एक है हार्मोनियम फाइल। हार्मोनियम फाइल में प्रकृतिक रूप से मृत हुई तितलियों को संरक्षित करके विशेष तरीके से रखा जाएगा। इसके अलावा उद्यान में जो तितलियां पाई जाती हैं उनके फोटोग्राफ लेकर उनके नाम आदि की जानकारी डॉटोग्राफ के साथ लगा दी जाएगी ताकि अनायास उन बॉर्ड को पढ़कर उसके बारे में समझ पाए।

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Holkar College students find 31 types of butterflies on campus

Students conduct butterfly survey to celebrate World Wildlife Week

OUR STAFF REPORTER
city.indore@fpj.co.in

To celebrate World Wildlife Week, the students of Holkar Science College went on a butterfly hunt, where they conducted a butterfly survey on the campus of the college. Twenty-one students of the college's Seed Club participated in the survey of on-campus butterflies. The theme of this year's Wildlife Week is, "A Shared Planet", in which the students of the college aim to understand the species better and vowed to conserve the wildlife of the planet.

Three teams of students conducted the survey on the college campus which is spread over 32 acres, under the leadership of prof. Dharmendra Jaat, prof. Rakesh Aloney and student Harsh Vishwakarma of the Department of Seed Technology.

In the survey, 31 types of butterflies were seen, observed, and their photos captured on camera by the students, who were delighted to see so many types of butterflies on the campus of their own college. Six types of pansies (Lemon, Blue, Chocolate, Peacock, Grey, and yellow pansy) were discovered by the students on the campus. For some students, it was the first time that they had come across nature's beautiful creation called butterflies and their eggs.

Curiosity awoke in students and they went on discussing the pansies with the on-field experts.

The principal of the college said that in future the responsibility of environmental protection will be in the hands of students, so it is very important to make them aware and motivated.

Before the survey, Sanjay Vyas, head of the department informed the students about the purpose of the survey, he said that it is very important to participate in such activities for all-round development which will not only bring them close to nature but also help them contribute in building a shared planet.

6 प्रकार की पेन्सी तितली को एकसाथ देख खुशी से झूम उठे विद्यार्थी

होलकर कॉलेज कैम्पस में विद्यार्थियों ने किया बटरफ्लाई सर्वे

इंदौर। वाइल्ड लाईड वीक के अंतर्गत शा.होलकर विज्ञान महाविद्यालय में सीड टेक्नोलॉजी डिपार्टमेंट द्वारा विद्यार्थियों को वन्यजीवों के संरक्षण हेतु प्रेरित करने के उद्देश्य से बटरफ्लाई सर्वे का आयोजन किया गया जिसमें महाविद्यालय के सीड क्लब के 21 विद्यार्थियों ने अपनी भागीदारी दी।

32 एकड़ में फैले कॉलेज कैम्पस में विद्यार्थियों की 3 टीमों ने सीड टेक्नोलॉजी विभाग के प्रो.धर्मेन्द्र जाट,प्रो.राकेश अलोने एवं छात्र हर्ष विश्वकर्मा के नेतृत्व में सर्वे किया। सर्वे में 31 प्रकार की तितलियों को विद्यार्थियों ने देखा एवं अपने कैमरे में उनकी फोटो ली,अपने महाविद्यालय के कैम्पस में इतने प्रकार की तितलियाँ देख विद्यार्थी खुशी से झूम उठे, महाविद्यालय में 6 प्रकार की पेन्सी (लेमन,ब्लू,चॉकलेट, पीकॉक, ग्रे एवं येलो पेन्सी) को एक समय मे देखना विद्यार्थियों को रोचक लगा,कुछ विद्यार्थियों ने तितली के अंडे पहली बार देखे,विद्यार्थियों ने तितलियों के बारे में कुछ प्रश्न भी पूछे जिनका उत्तर टीम के एक्सपर्ट ने दिए। महाविद्यालय के प्रचार्य डॉ सुरेश सिलावट ने बताया के भविष्य में पर्यावरण संरक्षण की जिम्मेदारी इन विद्यार्थियों के हाथों में ही रहेगी ,इसलिए इन्हें जागरूक एवं प्रेरित करना बेहद जरुरी। सर्वे से पूर्व विभाग के विभागाध्यक्ष डॉ संजय व्यास ने विद्यार्थियों को सर्वे के उद्देश्य के बारे में बताया उन्होंने विद्यार्थियों को बताया कि आपके सर्वांगीण विकास के लिए इस प्रकार की गतिविधियों में भागीदारी लेना बेहद जरुरी है। प्रभारी विभागाध्यक्ष डॉ कमला शिवनी ने विद्यार्थियों के उत्साह के साथ भागीदारी को सराहा। सर्वे के दौरान,विभाग के फैकल्टी प्रो गोविंद जाट,प्रो.पूजा खीरसागर, प्रो.अमित डेहरिया उपस्थित थे।

होलकर कॉलेज में बटरफ्लाई पार्क

इंदौर। होलकर साइंस कॉलेज के बीच तकनीकी विभाग की ओर से तितलियों के लिए बटरफ्लाई पार्क बनाया गया है। इसमें बरसात के मौसम में बहुत ही खूबसूरत नजारा देखने को मिलता है। यहां रंग-बिरंगी तितलियां जैसे कॉमन जिजबेल, कॉमन क्रो, प्लेन टाइगर, रेड पाइरेट, ग्रास येलो लेमन पेन्सी, टेल्ड जे, ब्लू टाइगर, ऐग फ्लाई, कामन एमिग्रेंट के साथ कई प्रकार की तितलियां पार्क में आकर फूलों पर बैठती है। पार्क की शुरुआत 2015-16 में उस समय के विभागाध्यक्ष ने की थी। पार्क में कई लार्वल होस्ट प्लांट के साथ फूल वाले पौधे जैसे लेंटाना, इक्जोरा, गेंदा, कॉसमॉस, सूरजमुखी आदि फूल वाले पौधे लगाए गए हैं जिन पर तितलियां बैठती हैं और अंडे देती है। वर्तमान में बटरफ्लाई पार्क का विकास एवं संरक्षण बीज तकनीकी विभाग एवं उद्यानिकी विभाग की विभागाध्यक्ष डॉ. किसलय पंचोली के साथ विभाग के प्राध्यापक धर्मेन्द्र जाट, इंदर पाटीदार, अशोक जाट, गोविंद जाट और कन्हैयालाल सनोडिया कर रहे हैं।

होलकर कॉलेज कैम्पस में वाइल्ड लाइफ वीक में विद्यार्थियों ने किया बटरफ्लाई सर्वे

विद्यार्थियों ने एकसाथ देखी 31 प्रकार की सुंदर तितलियां

खुलासा फर्स्ट... इंदौर

वाइल्ड लाइफ वीक के अंतर्गत शासकीय होलकर विज्ञान महाविद्यालय में सीड टेक्नोलॉजी डिपार्टमेंट द्वारा विद्यार्थियों को वन्यजीवों के संरक्षण के लिए प्रेरित करने के उद्देश्य से बटरफ्लाई सर्वे का आयोजन किया गया, जिसमें महाविद्यालय के सीड क्लब के 21 विद्यार्थियों ने भागीदारी की।

32 एकड़ में फैले कॉलेज कैम्पस में विद्यार्थियों की 3 टीमों ने सीड टेक्नोलॉजी विभाग के प्रो.धर्मेन्द्र जाट, प्रो.राकेश अलोने और डॉ.ज हार्ने

विरुकर्मा के नेतृत्व में सर्वे किया। सर्वे में विद्यार्थियों ने 31 प्रकार की तितलियां देखीं और अपने कैमरे में उनकी फोटो कैद की। अपने महाविद्यालय कैम्पस में इतने प्रकार की तितलियां देख विद्यार्थी खुशी से झूम उठे। महाविद्यालय में 6 प्रकार की पेन्सी (लेमन, ब्लू, चॉकलेट, पिकॉक, ग्रे और येलो) को एक समय में देखना विद्यार्थियों को रोचक लगा। कुछ विद्यार्थियों ने तितली के अंडे पहली बार देखे। विद्यार्थियों ने तितलियों के बारे में कुछ प्रश्न भी पूछे, जिनके उत्तर टीम के एक्सपर्ट्स ने दिए।

विद्यार्थियों को जागरूक और प्रेरित करना बेहद जरूरी

महाविद्यालय प्राचार्य डॉ. सुरेश सिलावट ने बताया कि भविष्य में पर्यावरण संरक्षण की जिम्मेदारी इन विद्यार्थियों के हाथों में ही रहेगी, इसलिए इन्हें जागरूक और प्रेरित करना बेहद जरूरी। सर्वे से पूर्व विभाग के विभागाध्यक्ष डॉ. संजय स्वामी ने विद्यार्थियों को सर्वे के उद्देश्य के बारे में बताया। उन्होंने विद्यार्थियों को बताया कि आपके सर्वांगीण विकास के लिए इस प्रकार की गतिविधियों में भागीदारी लेना बेहद जरूरी है। प्रभारी विभागाध्यक्ष डॉ. कमला शिवानी ने विद्यार्थियों के उत्साह के साथ भागीदारी को सराहा। सर्वे के दौरान विभाग के फैकल्टी प्रो. गोविंद जाट, प्रो.पूजा थोरस्वागर, प्रो.अमित डेहरिया उपस्थित थे।

गर्मियों में तितलियों को खूब रास आ रहा होलकर का तितली पार्क

इंदौर ■ राज न्यूज नेटवर्क

होलकर साइंस कॉलेज के बीज तकनीकी विभाग द्वारा विकसित बटरफ्लाई पार्क में इन दिनों तितलियों की बहार देखने को मिल रही है। इसकी वजह नेक्टर प्लांट्स के साथ साथ तितलियों के लिए मड पडलिंग के लिए उपयुक्त स्थान को विकसित करना है। बटरफ्लाई पार्क में इस गर्मी के मौसम में पार्क के कुछ हिस्से में 3 से 4 दिन के अंतराल पर पानी भरकर नर तितलियों द्वारा की जानी वाली मड पडलिंग के लिए उपयुक्त स्थान तैयार किया गया है ,जिससे पार्क में नर तितलियों द्वारा मड पडलिंग की क्रिया करते देखा जा रहा है। ये मौसम कई तितलियों के प्रजनन का समय भी है। बीज तकनीकी विभाग के प्रो धर्मेन्द्र जाट ने बताया कि गार्डन के कुछ हिस्से में पानी भरकर नम क्षेत्र विकसित करने से

तितलियों की संख्या में बेहद बढ़ोतरी देखी गयी है। गर्मियों के इस मौसम की दृष्टि से विकसित किया गया ये आशियाना तितलियों को खूब भा रहा है।

वंश वृद्धि के लिए नर तितली को मड पडलिंग करना आवश्यक: जानकारों के अनुसार अभी तक यही सोचने में आता है कि तितलियों की संख्या बढ़ाने के लिए पार्क या गार्डन में तितलियों के आकर्षण के लिए फ्लावरिंग प्लांट, नेक्टर प्लांट एवं होस्ट प्लांट लगाने की आवश्यकता होती है। ऐसा करना देना ही काफी नहीं है, अगर आप चाहते कि तितलियों की संख्या में बढ़ोतरी हो तो इसके लिये आपके गार्डन या तितलियों के पार्क में पानी भरकर कीचड़ वाला या नम क्षेत्र भी विकसित करना होगा। तितलियों को अपनी वंश वृद्धि के लिए नर तितली को मड पडलिंग करना आवश्यक होता है, क्योंकि तितलियों को अपने जीवन काल के लिए पोषक पदार्थ तो पौधों से लेने वाले मकरंद से मिल जाते है लेकिन अपनी वंश वृद्धि के लिए निषेचन के बाद अंडों का पूर्ण विकसित होना आवश्यक होता है। अंडों के पूर्ण विकसित होने के लिए मादा तितली को सोडियम एवं अमीनो एसिड की आवश्यकता होती है। यह सोडियम एवं अमीनो एसिड नर तितली द्वारा मेटिंग (निषेचन) के दौरान मादा के शरीर में स्थानांतरित कर दिया जाता है। यह पोषण अंडों के जीवित रहने की दर को भी बढ़ाता है, जिससे निषेचन के बाद अंडों का विकास अच्छे से होकर, उन अंडों में लार्वा का विकास अच्छे हो सके। मड पडलिंग की क्रिया अधिकतर नर तितली द्वारा की जाती है।

क्या है मड पडलिंग

यह कुछ कीटों विशेषकर तितलियों द्वारा की जाने वाली क्रिया है। इसमें नर तितलियां कीचड़, नम रेत ,नम मिट्टी एवम सड़ते हुए पौधों के तरल पदार्थों में पोषक तत्वों की तलाश कर उन्हें चूसते है जिससे उन्हें सोडियम एवं अमीनो एसिड प्राप्त हो जाये, यह क्रिया मड पडलिंग कहलाती है। यह क्रिया नर तितली अधिकतर नम रेतीली मिट्टी, सड़ते हुए पौधों के द्रव्यर्थ या क्षेत्र में करते है।

होलकर कॉलेज में बटरफ्लाई पार्क

इंदौर। शहर के शासकीय होलकर विज्ञान महाविद्यालय के बीज तकनीकी विभाग द्वारा तितलियों के लिए बनाया गया है बटरफ्लाई पार्क,जिसमें इस बरसात के मौसम में बहुत ही खूबसूरत नज़ारा है क्योंकि यहाँ रंग बिरंगी तितलियाँ जैसे कॉमन जिजबेल,कॉमन क्रो, प्लेन टाइगर,रेड पाइरेट, ग्रास येलो,लेमन पेन्सी,टेल्ड जे,ब्लू टाइगर,ऐग फ्लाई,कामन एमिग्रेंट के साथ कई प्रकार की तितलियाँ पार्क में आकर फूलों पर बैठती है।

पार्क की शुरुआत बीज तकनीकी विभाग के पूर्व विभागाध्यक्ष डॉ किशोर पंवार एवं प्रध्यापकों द्वारा 2015-16 में की गई थी,पार्क में कई लार्वल होस्ट प्लांट के साथ फूल वाले पौधे जैसे लेंटाना, इक्जोरा, गेंदा, कॉसमॉस, सूरजमुखी आदि फूल वाले पौधे लगाये गए है,जिन पर तितलियाँ बैठती है एवम अंडे देती है।महाविद्यालय के प्रचार्य डॉ सुरेश टी सिलावट ने बताया कि बटरफ्लाई पार्क को और बेहतर बनाने के लिए सभी सुविधाएं की जाएगी।

वर्तमान में बटरफ्लाई पार्क का विकास एवं संरक्षण बीज तकनीकी विभाग एवं उद्यानिकी विभाग की विभागाध्यक्ष डॉ. किसलय पंचोली के साथ विभाग के प्रध्यापक धर्मेन्द्र जाट,इंदर पाटीदार, अशोक जाट,गोविंद जाट एवं कन्हैयालाल सनोडिया द्वारा किया जा रहा है।

होलकर कॉलेज में पांच साल पहले बनाए गए बटरफ्लाई क्लब में खूबसूरत नजारा

बरसात में तरह-तरह की तितलियां आ रहीं

दबंग रिपोर्टर ■ इंदौर

शहर के गवर्नमेंट होलकर साइंस कॉलेज के बीज तकनीकी विभाग द्वारा तितलियों के लिए पांच साल पहले बनाया गया बटरफ्लाई पार्क शानदार नजारा पेश कर रहा है। इसमें बरसात के मौसम में रंग-बिरंगी तितलियों का नजारा दिखाई दे रहा है। कॉमन जिजबेल, कॉमन क्रो, प्लेन टाइगर, रेड पाइरेट, ग्रास यलो, लेमन पेन्सी, टेल्ड जे, ब्लू टाइगर, ऐग फ्लाई, कॉमन एमिग्रेंट जैसी कई प्रजातियों की तितलियां पार्क में आकर फूलों पर बैठ रही हैं।

पार्क की शुरुआत बीज तकनीकी विभाग के पूर्व विभागाध्यक्ष डॉ. किशोर पंवार और प्रोफेसर्स ने 2015-16 में की थी। पार्क में कई लार्वल होस्ट प्लांट के साथ फूल वाले पौधे जैसे लेंटाना, इक्जोरा, गेंदा, कॉसमॉस, सूरजमुखी आदि फूल वाले पौधे लगाए गए, जिन पर तितलियां बैठती हैं और अंडे देती हैं।

और सुविधाएं मिलेंगी

कॉलेज के प्रिंसिपल डॉ. सुरेश सिलावट ने बताया कि बटरफ्लाई पार्क को और बेहतर बनाने के लिए सभी सुविधाएं दी जा रही हैं। वर्तमान में बटरफ्लाई पार्क का विकास और संरक्षण बीज तकनीकी विभाग व उद्यानिकी विभाग की विभागाध्यक्ष डॉ. किसलय पंचोली के साथ विभाग के प्राध्यापक धर्मेन्द्र जाट, इंदर पाटीदार, अशोक जाट, गोविंद जाट और कन्हैयालाल सनोडिया द्वारा किया जा रहा है।

कई प्रजाति की पेन्सी तितलियों को एक साथ देखकर खुशी से झूम उठे पर्यावरण प्रेमी छात्र

पत्रिका plus रिपोर्टर

कुंदीर. खाचरौद ब्लॉक के अंतर्गत आ. होलकर विज्ञान महाविद्यालय में सीड टेक्नोलॉजी डिपार्टमेंट द्वारा विद्यार्थियों को बन्यजीवों के संरक्षण हेतु प्रेरित करने के उद्देश्य से बटरफ्लाई सर्वे का आयोजन किया गया जिसमें महाविद्यालय के सीड क्लब के 21 विद्यार्थियों ने अपनी भागीदारी दी।

32 एकड़ में फैले कॉलेज कैंपस में विद्यार्थियों की 3 टीमों ने सीड टेक्नोलॉजी विभाग के प्रो.धर्मेन्द्र जाट, प्रो.राकेश आर्मो एवं छात्र हर्ष विश्वकर्मा के नेतृत्व में सर्वे किया। सर्वे में 31 प्रकार की तितलियों को विद्यार्थियों ने देखा एवं अपने कैमरे में उनकी फोटो ली। अपने महाविद्यालय के कैंपस में इतने प्रकार की तितलियाँ देख विद्यार्थी खुशी से झूम उठे. महाविद्यालय में 6 प्रकार की पेन्सी (लेमन,ब्लू,चॉकलेट, पीकॉक, रेड एवं येल्लो पेन्सी) को एक समय में देखना विद्यार्थियों को रोचक लगा। कुल विद्यार्थियों ने तितली के ऑर्डर चार रोमी.विद्यार्थियों ने तितलियों के बारे में कुल प्रश्न भी पूछे जिनका उत्तर टीम के एक्सपर्ट ने दिए।

छात्र निभाएंगे पर्यावरण संरक्षण की जिम्मेदारी

महाविद्यालय के प्रभारी डॉ सुरेश सिलावट ने बताया की भविष्य में पर्यावरण संरक्षण की जिम्मेदारी इन विद्यार्थियों के हाथों में ही रहेगी। इसलिए इन्हें जागरूक एवं प्रेरित करना बेहद जरूरी है। सर्वे से पूर्व विभाग के विभागाध्यक्ष डॉ संजय व्यास ने विद्यार्थियों को सर्वे के उद्देश्य के बारे में बताया उन्होंने विद्यार्थियों को बताया कि आपके सर्वांगीण विकास के लिए इस प्रकार की गतिविधियों में भागीदारी लेना बेहद जरूरी है। प्रभारी विभागाध्यक्ष डॉ कमल किराडी ने विद्यार्थियों के उत्साह के साथ भागीदारी को सराहा। सर्वे के दौरान विभाग के फैकल्टी प्रो.वीरेंद्र जाट प्रो.पूजा बीरसागर, प्रो.अमित डोडरिया उपस्थित थे।

कैमरे में कैद हुईं रंगबिरंगी तितलियां

होलकर कॉलेज में तितली संरक्षण के लिए जागरूकता अभियान

इंदौर » सिटी रिपोर्टर

अपने आसपास उड़ती तितलियों को देखना सुखद लगता है। तितलियां अपनी खूबसूरती के साथ साथ विभिन्न प्रकार के फल एवं सब्जियों वाले पौधे में परागण हेतु भी महत्वपूर्ण भूमिका निभाती है, लेकिन आजकल तितलियों की लगातार कम होती संख्या चिंताजनक है। इनके संरक्षण की आवश्यकता को देखते हुए होलकर साइंस कॉलेज के बीज तकनीकी विभाग ने जागरूकता अभियान शुरू किया है। इसके अंतर्गत कई प्रतियोगिताओं का आयोजन किया गया।

विभाग द्वारा होलकर कॉलेज के बटरफ्लाई पार्क में महाविद्यालय स्तर पर फोटोग्राफी प्रतियोगिता का आयोजन किया, जिसमें महाविद्यालय के टीचिंग स्टॉफ ने भागीदारी की। इन्होंने रंगबिरंगी तितलियों को अपने कैमरे में कैद किया। प्रतियोगिता में कॉलेज के प्रो. पीयूष जोशी प्रथम, प्रो. तरुणा वर्मा द्वितीय और प्रो. दीपक चौधरी ने तृतीय स्थान प्राप्त किया। निर्णायक की भूमिका डॉ किशोर पंवार एवं डॉ. विपुल कीर्ति शर्मा ने निभाई।

गेंदा से लेकर कढ़ी पत्ता तक

महाविद्यालय के प्राचार्य डॉ. सुरेश सिलावट ने इस पहल को सराहते हुए बताया कि तितलियां एक प्रमुख जीव है और इनका संरक्षण करना बेहद जरूरी है। इस कार्य के लिए समाज के हर वर्ग को जिम्मेदारी लेनी होगी। प्रो. धर्मेन्द्र जाट ने सभी प्रतिभागियों को पार्क में पाई जाने वाली तितलियों की प्रजातियों एवं अपने घर एवं गार्डन में तितलियों के आकर्षण हेतु लगाए जाने वाले पौधों की जानकारी दी। तितलियों के संरक्षण हेतु हम अपने घर के गार्डन या बगीचे में फूल वाले पौधे जैसे गेंदा, कॉसमॉस, सूरजमुखी, लेंटाना, इकजोरा एवं लार्वाल होस्ट प्लांट अशोक, बिलपत्र, कड़ी पत्ता पौधे लगाकर बटरफ्लाई के आकर्षक एवं संरक्षण का कार्य किया जा सकता है। विभाग की विभागाध्यक्ष डॉ संजीदा इकबाल एवं प्रोफेसर्स इंदर पाटीदार, अशोक जाट, गोविंद जाट, कन्हैयालाल सनोडिया ने सभी प्रतिभागियों का स्वागत किया।

तितलियों को बचाने के लिए प्रतियोगिता

इंदौर। तितलियों को अपने घर के आसपास या गार्डन में उड़ते देखना बहुत ही सुखद लगता है, लेकिन आजकल तितलियों की संख्या कम होने लगी है। तितलियों के संरक्षण की बहुत आवश्यकता है। इनके संरक्षण के लिए आमजन को जागरूक करना बेहद जरूरी है। इसी उद्देश्य को ध्यान में रखकर होलकर साइंस कॉलेज के बीज तकनीकी विभाग की ओर से कॉलेज में बटरफ्लाई पार्क में कॉलेज स्तर पर बटरफ्लाई फोटोग्राफी प्रतियोगिता का आयोजन किया।

इसमें कॉलेज के प्राध्यापक व अतिथि विद्वानों ने उत्साह से भाग लिया। प्रतियोगिता में कॉलेज के पीयूष जोशी फर्स्ट, तरुणा वर्मा और प्रोफेसर दीपक चौधरी पर रहे। निर्णायक की भूमिका डॉ. किशोर पंवार पूर्व विभागाध्यक्ष बीज तकनीकी और डॉ. विपुल कीर्ति शर्मा ने निभाई।

विभाग की विभागाध्यक्ष डॉ. संजीदा इकबाल और विभाग के प्राध्यापक इंदर पाटीदार और अशोक जाट, गोविंद जाट, कन्हैयालाल सनोडिया ने स्वागत किया। प्राध्यापक धर्मेन्द्र जाट ने सभी प्रतिभागियों को पार्क में पाई जाने वाली तितलियों की प्रजातियों व अपने घर और गार्डन में तितलियों के आकर्षण के लिए पौधे लगाने की जानकारी दी। उन्होंने बताया हम अपने घर के गार्डन या बगीचे में फूल वाले पौधे जैसे गेंदा, कॉसमॉस, सूरजमुखी, लेंटाना, इकजोरा, लावेंडर, होस्टा, अशोक, बिलपत्र, कड़ी पत्ता के पौधे लगाकर बटरफ्लाई के आकर्षण और संरक्षण कर सकते हैं।

होल्कर कॉलेज में बटर फ्लाई फोटोग्राफी प्रतियोगिता

इंदौर ● स्वदेश समाचार

तितलियों को अपने घर के आसपास या गार्डन में उड़ते देखना कितना सुखद लगता है, पर आजकल तितलियों की संख्या कम होने लगी है। अतः इनके संरक्षण की आवश्यकता है। इसी उद्देश्य को ध्यान में रखकर होल्कर विज्ञान महाविद्यालय के बीज तकनीकी विभाग द्वारा महाविद्यालय के बटरफ्लाई पार्क में महाविद्यालय स्तर पर बटरफ्लाई फोटोग्राफी प्रतियोगिता का आयोजन किया गया।

महाविद्यालय के प्राध्यापक एवं अतिथि विद्वानों ने बड़े उत्साह से भागीदारी की। प्रतियोगिता में महाविद्यालय के प्राध्यापक पीयूष जोशी प्रथम, प्रो. सुश्री तरुणा वर्मा द्वितीय एवं प्रो. दीपक चौधरी ने तृतीय स्थान प्राप्त किया। निर्णायक की भूमिका डॉ. किशोर पंवार (पूर्व विभागाध्यक्ष बीज तकनीकी) एवं डॉ. विपुल कीर्ति शर्मा ने निभाई।

महाविद्यालय के प्राचार्य डॉ. सुरेश सिलावट ने इस पहल को सराहा। विभाग की विभागाध्यक्ष डॉ. संजीदा इकबाल एवं विभाग के प्राध्यापक इंदर पाटीदार एवं अशोक जाट ने सभी प्रतिभागियों का स्वागत किया। प्राध्यापक धर्मेन्द्र जाट ने सभी प्रतिभागियों को पार्क में पाई जाने वाली तितलियों की प्रजातियों आदि की जानकारी दी। 09/09/21

College butterfly photography competition

Indore: On Wednesday, the seed technology department

of Holkar Science College organised a butterfly photography competition at the college level in the Butterfly Park of the college in which the students, professors and guest scholars participated with great enthusiasm. Prof. Piyush Joshi, prof. Tarun Verma and prof. Deepak Choudary bagged prizes. The judges were Dr Kishore Panwar, former head of the department, seed technology, and Dr Vipul Kirti Sharma.

12/09/21

आजकल कम होने लगी है तितलियों की संख्या

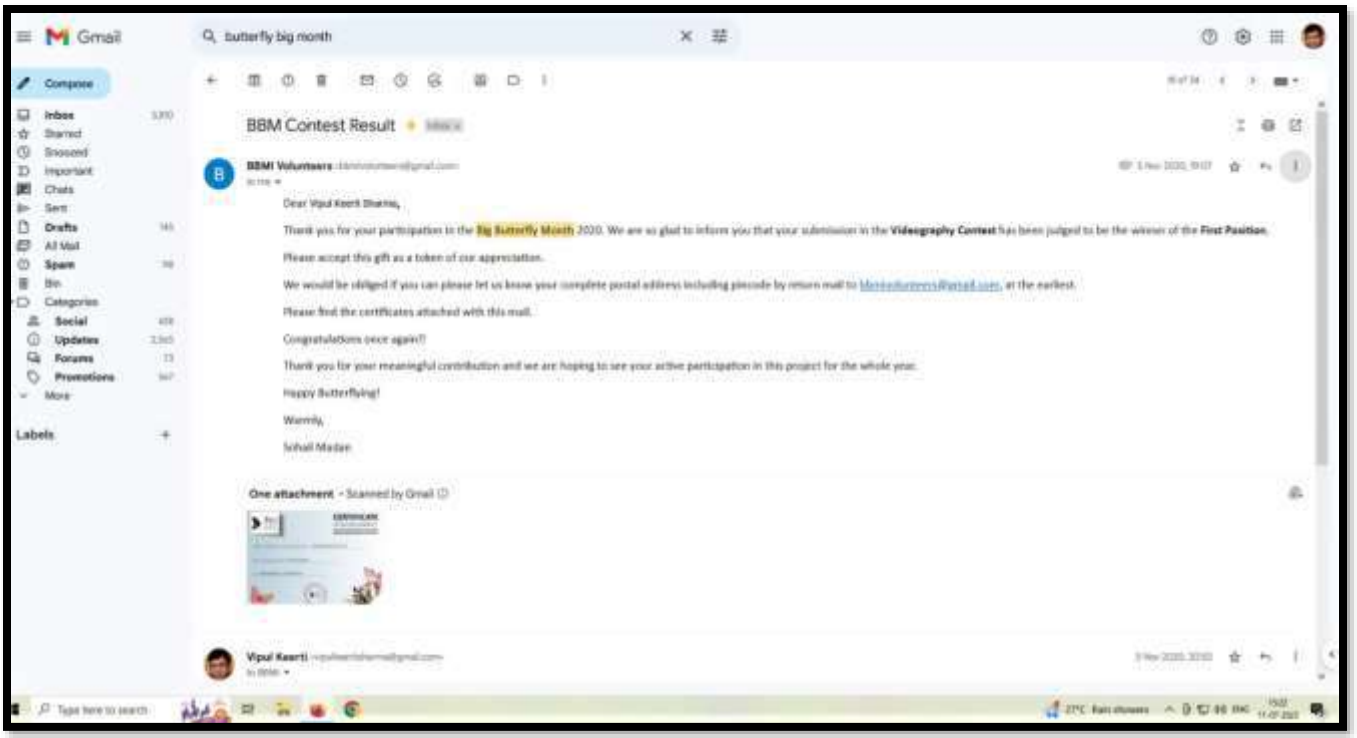
इंदौर। तितलियों को अपने घर के आसपास या गार्डन में उड़ते देखना कितना सुखद लगता है,पर क्या आपने यह महसूस किया है? कि आजकल तितलियों की संख्या कम होने लगी है,और क्या आपने सोचा है कि इनकी संख्या कम क्यों होती जा रही? आपको बता दें तितलियाँ अपनी खूबसूरती के साथ साथ विभिन्न प्रकार के फल एवं सब्जियों वाले पौधे में परागण हेतु भी महत्वपूर्ण भूमिका निभाती है।

09/09/21

अतः इनके संरक्षण की आवश्यकता है और इनके संरक्षण के लिए आमजन को जागरूक करना बेहद जरूरी है,इसी उद्देश्य को ध्यान में रखकर होलकर विज्ञान महाविद्यालय के बीज तकनीकी विभाग द्वारा महाविद्यालय के बटरफ्लाई पार्क में महाविद्यालय स्तर पर बटरफ्लाई फोटोग्राफी प्रतियोगिता का आयोजन किया जिसमें महाविद्यालय के प्राध्यापक एवं अतिथि विद्वानों ने बड़े उत्साह से भागीदारी ली ,प्रतियोगिता में

महाविद्यालय के प्राध्यापक दीपेश जोशी प्रथम, प्रो. सुश्री तरुणा वर्मा द्वितीय एवं प्रो. दीपक चौधरी तृतीय स्थान प्राप्त किया। प्रतियोगिता में निर्णायक की भूमिका डॉ किशोर पंवार पूर्व विभागाध्यक्ष बीज तकनीकी एवं डॉ विपुल कीर्ति शर्मा ने निभाई। महाविद्यालय के प्राचार्य डॉ. सुरेश मिलावट ने इस पहल को सराहा एवं बताया कि तितलियाँ एक प्रमुख जीव है इनका संरक्षण करना बेहद जरूरी है और इस कार्य के लिए समाज के हर वर्ग को जिम्मेदारी लेनी होगी। विभाग की विभागाध्यक्ष डॉ संजीदा इकबाल एवं विभाग के प्राध्यापक इदर पाटीदार एवं अशोक जाट, गोविंद जाट ,कन्हैयालाल सनोडिया ने सभी प्रतिभागियों का स्वागत किया।

प्राध्यापक धर्मेन्द्र जाट ने सभी प्रतिभागियों को पार्क में पाई जाने वाली तितलियों की प्रजातियों एवं अपने घर एवं गार्डन में तितलियों के आकर्षण हेतु कौन कौन से पौधे लगाये वे जानकारी प्रदान की एवं तितलियों के संरक्षण हेतु हम अपने घर के गार्डन या बगीचे में फूल वाले पौधे जैसे गेंदा, कॉसमॉस, सूरजमुखी, लेंटाना, इक्जोरा एवं लाभांश होस्ट प्लांट अशोक, बिलपत्र, कड़ी पत्ता आदि पौधे लगाकर बटरफ्लाई के आकर्षक एवं संरक्षण का कार्य कर सकते है बताया।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Updates
Forums
Promotions
More
Labels
BBM Contest Result
BBMI Volunteers
Dear Vipul Keerti Sharma,
Thank you for your participation in the Big Butterfly Month 2020. We are so glad to inform you that your submission in the Videography Contest has been judged to be the winner of the First Position.
Please accept this gift as a token of our appreciation.
We would be obliged if you can please let us know your complete postal address including pincode by return mail to bbmvolunteers@gmail.com, at the earliest.
Please find the certificates attached with this mail.
Congratulations once again!!
Thank you for your meaningful contribution and we are hoping to see your active participation in this project for the whole year.
Happy Butterflying!
Warmly,
Ishail Madan
One attachment • Scanned by Gmail
Vipul Keerti


BIG BUTTERFLY MONTH INDIA 2020
CERTIFICATE
OF ACHIEVEMENT
BIG BUTTERFLY MONTH: INDIA 2020
This certificate is presented to Vipul Keerti Sharma
for attaining the First Position
in Videography Competition
BIG BUTTERFLY MONTH INDIA 2020
