



Central University of Himachal Pradesh
(ESTABLISHED UNDER CENTRAL UNIVERSITIES ACT 2009)
Dharamshala, Himachal Pradesh-176215



NAAC Criterion-I

Key Indicator –1.3.4

**Percentage of students undertaking
field project/research
project/internship**

1.3.4 Evidences



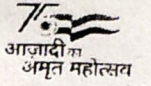
**Department of Animal Science
Central University of Himachal Pradesh, Dharamshala,
Kangra**



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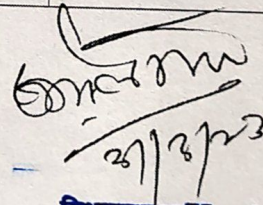
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Department of Animal Science

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3	Report of the field visit / sample photographs of the field visit / permission letter from the competent authority.	37-88



विभागाध्यक्ष/Head

पशु विज्ञान विभाग/Department of Animal Sciences

जीव विज्ञान स्कूल/School of Life Sciences

हिमाचल प्रदेश केंद्रीय विश्वविद्यालय धर्मशाला

Central University of Himachal Pradesh

File No: Animal science/1-2/PG/CUHP/21/640
Dated 20/01/23

DISSERTATION TOPIC OF
M.Sc ZOOLOGY 4TH SEMESTER STUDENTS SESSION, 2020 – 2022

S. No.	Roll. No.	Name of Student	Title of Topic	Name of The Faculty Supervisor
1	CUHP20ZOO01	AAKASH RATHOUR	Biology, Morphometry and Biopesticide Activity of <i>roylea cinerea</i> against <i>Plutella xylostella</i> L. (Diamondback moth).	Dr. Rakesh Kumar
2	CUHP20ZOO02	AKRITI SHARMA	Ethnozoological study on use of animal and animal derived products in traditional medicine in Arki area of district Solan, Himachal Pradesh.	Dr. Sunil Kumar
3	CUHP20ZOO03	ANJALI KUMARI	COMPARISON OF DIVERSITY AND GROWTH PATTERN OF LACTOBACILLUS FROM CURD AND BUTTERMILK.	Dr. Ranjit Kumar
4	CUHP20ZOO04	ANKITA	Water Quality Assessment of Major Tributaries of River Beas (Baner and Gaj).	Dr. Rakesh Kumar
5	CUHP20ZOO05	ANSHUTA SHARMA	STUDY ON DISTRIBUTION PATTERN OF MACRO-BENTHOS DIVERSITY IN RELATION TO NUTRIENTS OF PONG RESERVOIR, KANGRA (H.P)	Dr. Sunil Kumar
6	CUHP20ZOO06	ANURADHA RANI	To study weight loss of different pulses by <i>Callosobruchus chinensis</i> L. and their biopesticidal management	Dr. Ranjit Kumar
7	CUHP20ZOO07	ARTI GULERIA	A Survey of Cage culture site at Pong Reservoir.	Dr. Rakesh Kumar
8	CUHP20ZOO08	BANWARI YADAV	An Astounding Biodiversity of Butterflies in Shahpur area of Kangra district, Himachal Pradesh.	Dr. Sunil Kumar
9	CUHP20ZOO09	CHEITNA	To analyze physiochemical property of water and microbial diversity in water	Dr. Ranjit Kumar

			source from Chhetri	
10	CUHP20ZOO10	DEEKSHA THAKUR	Anthropogenic Impact of Habitat Ecological Parameters on Plankton Diversity in Pong Reservoir, Kangra (H.P)	Dr. Rakesh Kumar
11	CUHP20ZOO11	HARSHITA MEHTA	Length-weight relationship of selected fish species from Govind Sagar reservoir ,Bilaspur (H.P).	Dr. Sunil Kumar
12	CUHP20ZOO12	KANUPRIYA	To evaluate role of yeast on the growth of wheat plant.	Dr. Ranjit Kumar
13	CUHP20ZOO13	MANISH SHARMA	Food and Feeding Habits of <i>Tor putitora</i> and <i>Schizothorax richardsonii</i> Fish Species in Beas River at Mandi(H.P)	Dr. Amit Kumar Sharma
14	CUHP20ZOO14	MANSI CHOUDHARY	Analysis of Water Quality of Manuni Stream.	Dr. Sunil Kumar
15	CUHP20ZOO15	MANSI PATHANIA	To study comparative pH tolerance of <i>Lactobacillus</i> isolated from curd and lassi.	Dr. Ranjit Kumar
16	CUHP20ZOO16	MANVEEN KAUR	A Study on Physico- Chemical and Biological Parameters of Selected Pond Water Bodies at Shahpur, Kangra (H.P).	Dr. Rakesh Kumar
17	CUHP20ZOO17	MEENAKSHI	Survey on Pollinator insects of Shahpur, District Kangra with special reference to mango pollinators.	Dr. Sunil Kumar
18	CUHP20ZOO18	MRINAL	BIOLOGY OF TOBACCO CATERPILLAR (<i>SPODOPTERA LITURA</i>) ON FRENCH BEAN AND AMARANTH	Dr. Ranjit Kumar
19	CUHP20ZOO19	NAMITA SHARMA	Study on Biology and Bio- management of <i>Tuta absoluta</i> .	Dr. Amit Kumar Sharma
20	CUHP20ZOO20	POOJA THAKUR	Traditional and Medicinal uses of Animals and their parts in Karsog division of Mandi district,(H.P).	Dr. Sunil Kumar
21	CUHP20ZOO21	RAJAT BHATIA	Microbial Diversity in Different Water Sources of Kangra district.	Dr. Reshma Sinha

22	CUHP20ZOO22	RASHI KAPUR	Water quality status of river Ravi at Chamba (H.P)	Dr. Rakesh Kumar
23	CUHP20ZOO23	SALONI	Assessment of Physico- Chemical and Microbial Properties of Ice Used for Various Purposes in Kangra City (H.P)	Dr. Sunil Kumar
24	CUHP20ZOO24	SAMRITI NEGI	To Study Morphological characteristics and growth pattern of <i>Lactobacillus</i> in different pH	Dr. Ranjit Kumar
25	CUHP20ZOO25	SANGEETA	Identification and Quantition of Microplastics in Water Bodies of Kangra District of Himachal Pradesh.	Dr. Rakesh Kumar
26	CUHP20ZOO26	SHILPA DEVI	Population Status of Water Dependent Birds in Pong Wetland at District Kangra (H.P)	Dr. Amit Kumar Sharma
27	CUHP20ZOO27	SNEHA THAKUR	Effect of Earthworm Species on the Physico- Chemical Properties of Soil in District Kangra.	Dr. Ranjit Kumar
28	CUHP20ZOO28	SONIA	Histopathological study on the gills of predatory fish <i>Xenentodon cancila</i> infected by <i>Eustrongylides excises</i> larvae	Dr. Reshma Sinhar
29	CUHP20ZOO29	SONIA THAKUR	Earthworm Diversity near Shahpur region of District Kangra (H.P)	Dr. Amit Kumar Sharma
30	CUHP20ZOO30	SUJETA KUMARI	Evaluating the effects of two agricultural pesticide on Mosquito larvae	Dr. Reshma Sinha
31	CUHP20ZOO31	TRIPTA DEVI	Population Dynamics of Selected Endemic Fish Species in Pong Reservoir, Kangra(HP)	Dr. Rakesh Kumar
32	CUHP20ZOO32	VINEET SINGH	Status and Diversity of Birds in Kangra and Chamba District of Himachal Pradesh.	Dr. Reshma Sinha
33	CUHP20ZOO33	YOGITA	Assessment of Microplastics In Soil Sample From District Kangra, Himachal Pradesh.	Dr. Reshma Sinha



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Dharamshala (HP) - 176215

Dated: 12.07.22

Department of Animal Sciences
School of Life Sciences

Central University of Himachal Pradesh, Dharamshala
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Dharamshala, District Kangra,
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This to certify that the dissertation entitled "**Traditional and medicinal uses of Animals and their parts in Karsog division of Mandi district, (H.P)**" submitted by **Pooja Thakur (CUHP20ZOO20)** D/o **Dharam Singh** to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.

Dr. Sunil Kumar
Supervisor

Dr.
External Examiner
Dr. Thakur

Head of the Department
(Dr. Sunil Kumar)

Dean of School of Life Sciences
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This is certify that the dissertation entitled “**Study on Distribution Pattern of Macro-benthos diversity in relation to nutrients of Pong Reservoir, Kangra (H.P)**” submitted by **Anshuta Sharma (CUHP20ZOO05)** D/o Sh. Shyam Lal to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


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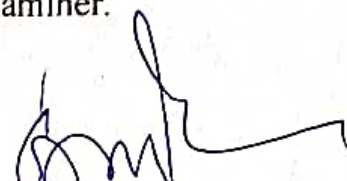
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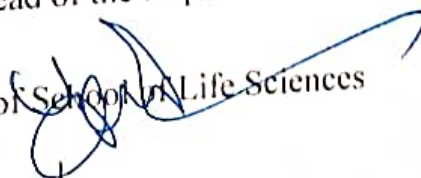
This to certify that the dissertation entitled “Length-weight relationship of selected fish species from Gobind Sagar reservoir ,Bilaspur(H.P)” submitted by Harsita mehta (CUHP20ZOO11) D/o/ S/o Sh. Subhash chand to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


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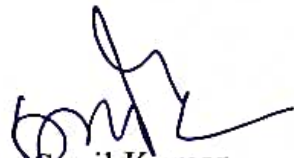
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This to certify that the dissertation entitled “Survey on pollinator insects of Shahpur, District Kangra with special reference to mango pollinators” submitted by Meenakshi (CUHP20ZOO17) D/o Sh. Kuldeep Kumar to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


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This to certify that the dissertation entitled “**Ethnozoological study on use of animal and animal derived products in traditional medicine in Arki area of district Solan, Himachal Pradesh**” submitted by **Akriti Sharma (CUHP20ZOO02) D/o Jai krishan** to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


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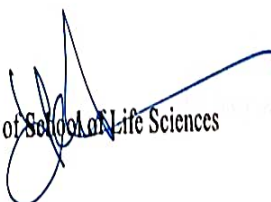
Himachal Pradesh [India] - 176215

This to certify that the dissertation entitled "An Astounding Biodiversity of Butterflies in Shahpur area of Kangra district, Himachal Pradesh" submitted by Banwari Yadav (CUHP20ZOO08) S/o Shri Shyoji Lal Yadav to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


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Dated: 12 July 22

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Dharamshala, District Kangra,
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This to certify that the dissertation entitled “ **Analysis of Water Quality of Manuni Stream**” submitted by **Manshi Choudhary**(CUHP20ZOO14) D/O Shri Ram Pal to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.

Dr.....
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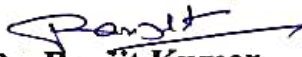
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This is to certify that the dissertation entitled “**Analysis of Physiochemical Properties and Microbial Diversity of Water bodies from Chhatri, Kangra (H.P.)**” submitted by **Chetna (CUHP20Z0009)** D/o **Surender Singh** to the Central University of Himachal Pradesh, Dharamshala in partial fulfilment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


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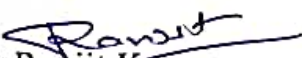
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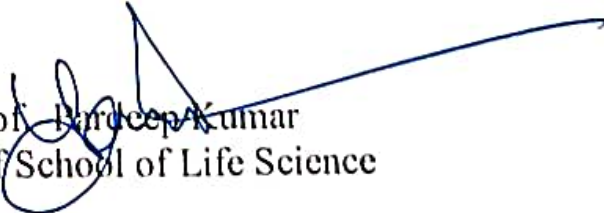
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This is to certify that the dissertation entitled “**To study weight loss of different pulses by *Callosobruchus chinensis* and their biopesticidal management**” submitted by **Anuradha Rani** (CUHP20ZOO06) D/o Naresh Kumar to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


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This is to certify that the dissertation entitled “**To evaluate role of yeast on growth of wheat plant**” submitted by **Kanupriya (CUHP20ZOO12)** D/o/ .Mr. Prakash Chand the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


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This to certify that the dissertation entitled “To study Morphological characteristics and growth of *Lactobacillus* in different pH” submitted by **Samriti negi** (CUHP20ZOO24) D/o/ .Mr. Goverdhan Dutt. to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


Dr. Ranjit Kumar.
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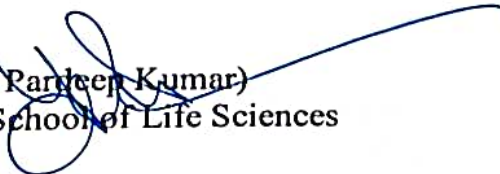
Dated: 12-07-2022

This is to certify that the dissertation entitled "**Comparison of Diversity and Growth Pattern of *Lactobacillus* from Curd and Buttermilk**" submitted by **Anjali Kumari (CUHP20ZOO03)** D/o Raj Singh to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


Dr. Ranjit Kumar
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(Dr. Pardeep Kumar)
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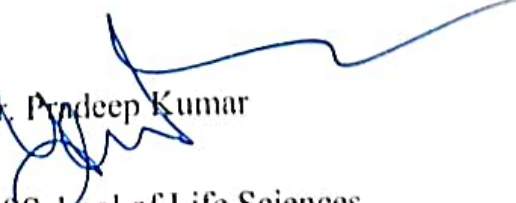
This is to certify that the dissertation entitled “**To study comparative pH tolerance of *Lactobacillus* isolated from curd and lassi**” submitted by Ms. Mansi Pathania (CUHP20ZOO15) D/o Mr. Sanjeev Pathania to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


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Dr. Sunil Kumar


Dr.....
External Examiner

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Dr. Pradeep Kumar
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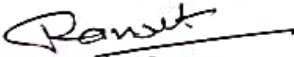
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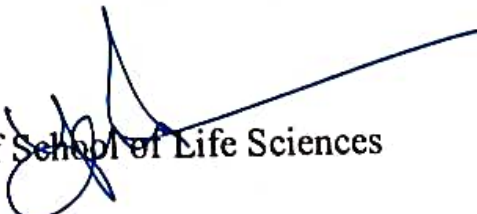
This is to certify that the dissertation entitled “**Microbial Diversity in Different Water Sources of Kangra District**” submitted by **Rajat Bhatia (CUHP20ZOO21)** S/o Sh. Ravinder Kumar to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


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This to certify that the dissertation entitled “Effect of earthworm species on the physico-chemical properties of soil in District Kangra” submitted by Sneha Thakur (CUHP20ZOO27) D/o Rakesh Kumar to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


Dr. Reshma Sinha

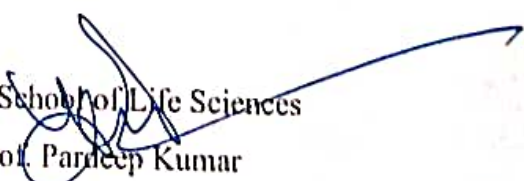
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Dated: 12 July, 2022

Department of Animal Science

School of Life Sciences

Central University of Himachal Pradesh, Dharamshala

[Established under the Central Universities Act 2009]

Dharamshala, District Kangra,

Himachal Pradesh [India] - 176215

This to certify that the dissertation entitled "Earthworm diversity near Shahpur region of District Kangra (H.P.)" submitted by Sonia Thakur (CUHP20ZOO29) D/O Kheema Ram to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.

Dr. Reshma Sinha

Supervisor

Dr.

External Examiner

Head of the Department

(Dr. Sunil Kumar)

Dean of School of Life Sciences

(Prof. Pardeep Kumar)



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Central University of Himachal Pradesh
(Established under Central Universities Act 2009)
Dharamshala (HP) - 176215

CERTIFICATE

Dated: 14th July 2022

Department of Animal Sciences

School of Life Sciences

Central University of Himachal Pradesh, Dharamshala

[Established under the Central Universities Act 2009]

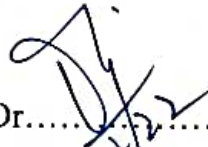
Dharamshala, District Kangra,

Himachal Pradesh [India]– 176215

This to certify that the dissertation entitled “**Assessment of Microplastic in soil sample from district Kangra, Himachal Pradesh.**” submitted by Yogita (CUHP20ZOO33) D/o **Sh. Kartar singh** to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


Dr. Reshma Sinha

Supervisor


Dr.....
External Examiner


Prof. Prateek Kumar

Dean of School of Life Sciences



हिमाचल प्रदेश केंद्रीय विश्वविद्यालय

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Dharamshala (HP) - 176215

CERTIFICATE

Dated: 12th July 2022

Department of Animal Sciences

School of Life Sciences

Central University of Himachal Pradesh, Dharamshala

[Established under the Central Universities Act 2009]

Dharamshala, District Kangra,

Himachal Pradesh [India] – 176215

This is to certify that the dissertation entitled “**Identification and Quantitation of Microplastics in Water Bodies of Kangra District of Himachal Pradesh.**” submitted by **Sangeeta (CUHP20ZOO25)** D/o Sh. Ashok Kumar to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.

Dr. Reshma Sidha

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Prof. Pradeep Kumar

Dean of School of Life Sciences



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Dharamshala (HP) - 176215

CERTIFICATE


Dated: 18-7-2022

Department of Animal Sciences
School of Life Sciences
Central University of Himachal Pradesh, Dharamshala
[Established under the Central Universities Act 2009]
Dharamshala, District Kangra,
Himachal Pradesh [India] - 176215

This to certify that the dissertation entitled "Biology of tobacco caterpillar (*Spodoptera litura*) on French bean and Amaranth" submitted by Mrinal (CUHP20ZOO18) D/o/ Sh. Sunil Dutt and Smt. Manju Kumari to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


Dr. Reshma Sinha

Supervisor


Dr.....
External Examiner


Dr. Sunil Kumar

Head of the Department


Prof. Pradeep Kumar

Dean of School of Life Sciences



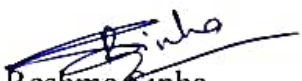
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Central University of Himachal Pradesh
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Dharamshala (HP) - 176215


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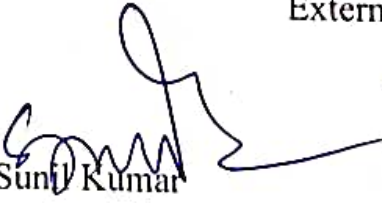
Dated : 19 July 2022

Department of Animal Sciences
School of Life Sciences
Central University of Himachal Pradesh, Dharamshala
[Established under the Central Universities Act 2009]
Dharamshala, District Kangra,
Himachal Pradesh [India] - 176215

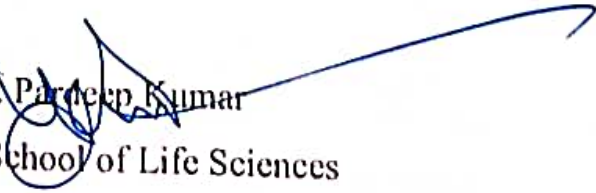
This to certify that the dissertation entitled “Evaluating the effects of two agricultural pesticides on mosquito larvae” submitted by Sujeta Kumari (CUHP20ZOO30) D/o/ Shakeen Chand to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


Dr. Reshima Sinha
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Dr.....
External Examiner


Dr. Sunil Kumar

Head of the Department


Prof. Pardeep Kumar
Dean of School of Life Sciences



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Dharamshala (HP) - 176215

CERTIFICATE

Dated: 12-07-22.

Department/Centre
School of Life Sciences
Central University of Himachal Pradesh, Dharamshala
[Established under the Central Universities Act 2009]
Dharamshala, District Kangra,
Himachal Pradesh [India] – 176215

This to certify that the dissertation entitled “**Anthropogenic Impact of Habitat Ecological Parameters on Plankton Diversity in Pong Reservoir, Kangra (HP)**” submitted by **Deeksha Thakur** (CUHP20ZOO10) D/o Sh. Kashmir Singh Thakur to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.

Dr. Amit Kr. Sharma
Supervisor

Dr.....
External Examiner

Head of the Department

Dean of School of Life Sciences



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[Established under the Central Universities Act 2009]
Dharamshala, District Kangra,
Himachal Pradesh [India] - 176215

This to certify that the dissertation entitled "A Study on Physico-Chemical and Biological Parameters of Selected Pond Water Bodies at Shahpur, Kangra (HP)" submitted by Manveen Kaur (CUHP20ZOO16) D/o Kamaljit Singh to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.

Dr. AMIT KR. SHARMA
Supervisor

Dr.....
External Examiner

Head of the Department

Dean of School of Life Sciences



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Department/Centre

School of Life Sciences

Central University of Himachal Pradesh, Dharamshala

[Established under the Central Universities Act 2009]

Dharamshala, District Kangra,

Himachal Pradesh [India] – 176215

This to certify that the dissertation entitled “**Assessment of Physico-Chemical and Microbial Properties of Ice Used for Various Purposes in Kangra City (HP)**” submitted by **Saloni (CUHP20ZOO23)** D/o **Sh. Vijay Kumar** to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.

Dr. Amit Kr. Sharma
Supervisor

Dr.....
External Examiner
12/7/22

Head of the Department

Dean of School of Life Sciences



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Central University of Himachal Pradesh, Dharamshala
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Dharamshala, District Kangra,
Himachal Pradesh [India] - 176215

This to certify that the dissertation entitled “**Population Status of Water Dependent Birds in Pong Wetland at District Kangra (HP)**” submitted by **Shilpa Devi (CUHP20ZOO26) D/o Sh. Vishnu** to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.

Dr. Amit Kr. Sharma
Supervisor

Dr.....
External Examiner

Head of the Department

Dean of School of Life Sciences



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ANIMAL SCIENCES

School of Life Sciences

Central University of Himachal Pradesh, Dharamshala

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Dharamshala, District Kangra,

Himachal Pradesh [India] – 176215

This to certify that the dissertation entitled “**Population Dynamics of Selected Endemic Fish Species in Pong Reservoir, Kangra (HP)**” submitted by **Tripta Devi (CUHP20ZOO31)** D/o: **Om Parkash** to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.

Dr. Amit Kr. Sharma

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Head of the Department

Dean of School of Life Sciences



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Dharamshala, District Kangra,
Himachal Pradesh [India] – 176215

This to certify that the dissertation entitled “Status and Diversity of Birds in Kangra and Chamba District of Himachal Pradesh” submitted by Vineet Singh (CUHP20ZOO32) S/o Sh. Charan Das to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.

Dr. Amit Kr. Sharma
Supervisor

Dr.....
External Examiner

Head of the Department

Dean of School of Life Sciences



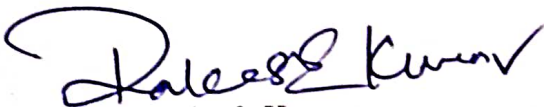
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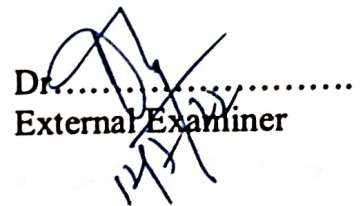
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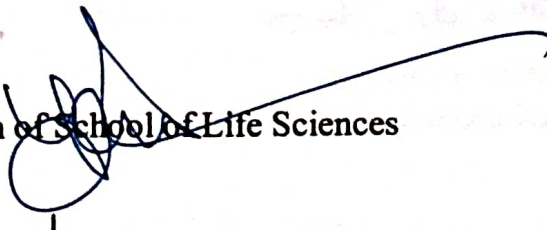
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School of Life Sciences
Central University of Himachal Pradesh, Dharamshala
[Established under the Central Universities Act 2009]
Dharamshala, District Kangra,
Himachal Pradesh [India] – 176215

This to certify that the dissertation entitled “Water Quality Assessment of Two Major Tributaries of River Beas (Baner and Gaj)” submitted by Ankita (CUHP20ZOO04) D/o Sh. Kalyan Singh to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


Dr. Rakesh Kumar
Supervisor


Dr.....
External Examiner


Head of the Department


Dean of School of Life Sciences



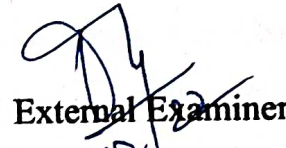
Central University of Himachal Pradesh
(Established under Central Universities Act 2009)
Dharamshala (HP) - 176215


Dated: 19 July 2022

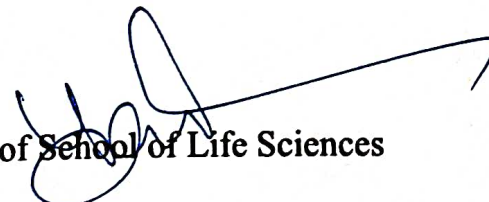
Department/Centre
School of Life Sciences
Central University of Himachal Pradesh, Dharamshala
[Established under the Central Universities Act 2009]
Dharamshala, District Kangra,
Himachal Pradesh [India] – 176215

This to certify that the dissertation entitled “**Histopathological study on the gills of predatory fish *Xenentodon cancila* infected by *Eustrongylides excisus* larvae** submitted by **Sonia** (CUHP20ZOO28) D/o Hira Lal to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


Dr. Rakesh Kumar.
Supervisor


External Examiner
14/7/22


Head of the Department


Dean of School of Life Sciences



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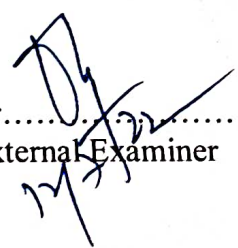
CERTIFICATE

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Department of Animal Sciences
School of Life Sciences
Central University of Himachal Pradesh, Dharamshala
[Established under the Central Universities Act 2009]
Dharamshala, District Kangra,
Himachal Pradesh [India] – 176215

This to certify that the dissertation entitled “Water quality status of river Ravi at Chamba(HP)” submitted by Rashi Kapur (CUHP20ZOO22) D/o/ S/o Sh Sanjay Kapur to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.

Dr. 
Supervisor

Dr. 
External Examiner


Head of the Department


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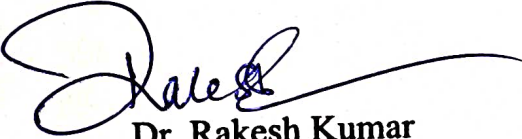
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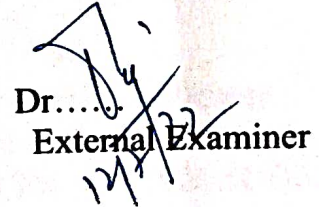
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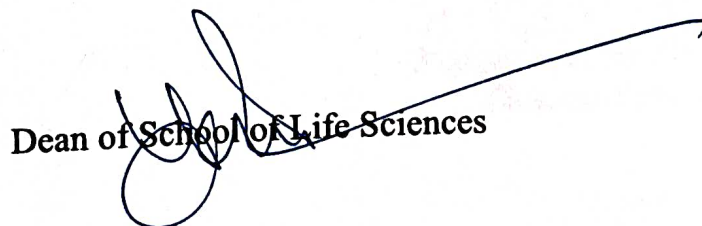
Department
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Dharamshala, District Kangra,
Himachal Pradesh [India] – 176215

This to certify that the dissertation entitled “A Survey of Cage culture site at Pong Reservoir ” submitted by **Arti Guleria (CUHP20ZOO07)** D/o/ Mr. Surinder Singh to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


Dr. Rakesh Kumar
Supervisor


Dr.....
External Examiner
12/7/22


Head of the Department


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हिमाचल प्रदेश केंद्रीय विश्वविद्यालय

Central University of Himachal Pradesh

(Established under Central Universities Act 2009)

Dharamshala (HP) - 176215

Dated:.....

Department/Centre

School of Life Sciences

Central University of Himachal Pradesh, Dharamshala

[Established under the Central Universities Act 2009]

Dharamshala, District Kangra,

Himachal Pradesh [India] – 176215

This to certify that the dissertation entitled “**Biology, Morphometry and Potent Biopesticide Activity of *Roylea cinerea* against *Plutella xylostella* L. (Diamondback moth)**” submitted by **Aakash Rathour** (CUHP20ZOO01) S/o Lekh Raj to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.

Dr. Rakesh Kumar.
Supervisor

External Examiner

Head of the Department

Dean of School of Life Sciences



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Pradesh

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2009)

Dharamshala (HP) - 176215

CERTIFICATE

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Department of Animal Science
School of Life Sciences

Central University of Himachal Pradesh, Dharamshala
[Established under the Central Universities Act 2009]
Dharamshala, District Kangra,
Himachal Pradesh [India] - 176215

This is to certify that the dissertation entitled “**Study of Biology and Bio-management of *Tuta absoluta***” submitted by Namita Sharna (CUHP20ZOO19) D/o Vinod Kumar to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.

Dr. Rakesh Kumar
Supervisor

Dr.....
External Examiner

(Dr. Sunil Kumar)

Head of the Department

(Dr. Pardeep Kumar)

Dean of School of Life Sciences



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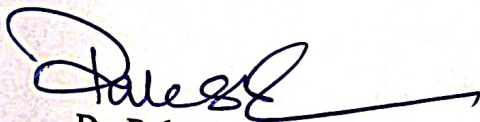
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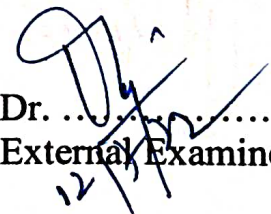
Dated:2022

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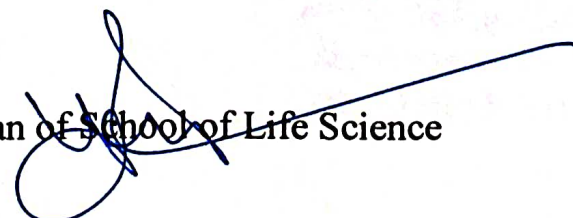
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Himachal Pradesh [India]- 176215

This to certify that the dissertation entitled “**Food and Feeding Habits of *Tor putitora* and *Schizothorax richardsonii* Fish Species in Beas River at Mandi (HP)**” submitted by **Manish Sharma (CUHP20ZOO13)** S/o **Brij Kishor** to the Central University of Himachal Pradesh, Dharamshala in partial fulfillment of the requirements for the award of degree of Master of Science in Zoology has been approved by the committee after an oral examination of the student in collaboration with an External Examiner.


Dr. Rakesh Kumar
Supervisor


Dr.
External Examiner


Head of the Department


Dean of School of Life Science

विषय: मार्च माह में शैक्षणिक भ्रमण (Educational Visit/Study Tour) के लिए प्रशासनिक अनुमोदन और वित्तीय स्वीकृति से सम्बंधित।

-14- जंतु विज्ञान विभाग के स्नातकोत्तर छात्रों (प्रथम सत्र एवं द्वितीय सत्र), से प्राप्त एक अनुरोध पत्र नीचे संलग्न है जिसमें उन्होंने उल्लेख किया है कि उनके पाठ्यक्रम के अनुसार पक्षियों के बारे में अध्ययन करने के लिए Pong Dam, जिला काँगड़ा, हिमाचल प्रदेश में शैक्षणिक भ्रमण करना चाहते हैं।

-15- इसलिए, यह अनुरोध किया जाता है कि, जंतु विज्ञान विभाग के स्नातकोत्तर छात्रों (प्रथम सत्र एवं द्वितीय सत्र) और विभाग की शोध छात्राओं के लिए पाठ्यक्रम के अनुसार पक्षियों के बारे में अध्ययन हेतु शैक्षणिक भ्रमण (Educational Visit/Study Tour) के लिए प्रशासनिक अनुमोदन और निम्नलिखित हेतु वित्तीय स्वीकृति के लिए फ़ाइल को माननीय कुलपति महोदय जी के कार्यालय में प्रेषित करने की कृपा करें।

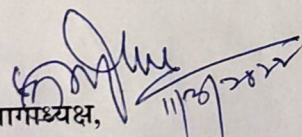
-16- 1. 40 स्नातकोत्तर विद्यार्थियों, 11 शोध विद्यार्थियों और 02 शिक्षकों और 01 गैर शिक्षण स्टाफ सदस्य के लिए 01 दिन के लिए 01 बस (HRTC) को ले जाने की अनुमति (शाहपुर से Pong Dam, और शाम को वापसी यात्रा)।

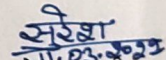
क्रं.सं./	विवरण	
1.	शाहपुर से Pong Dam	Pong Dam, जिला काँगड़ा, हिमाचल प्रदेश

-17- 2. शैक्षणिक भ्रमण पर हुए पार्किंग (Parking) व्यय को विश्वविद्यालय नियमों के अनुसार भुगतान करने हेतु स्वीकृति और इसके साथ ही विश्वविद्यालय में अनुबंध पर चलाई जा रही बसों में से किसी एक बस को शैक्षणिक भ्रमण के लिए इस्तेमाल करने हेतु स्वीकृति।

-18- प्रस्तावित अध्ययन हेतु शैक्षणिक भ्रमण (Educational/Study Tour) से संबंधित पूरा खर्च, छात्रों के व्यावसायिक विकास निधि (Professional Development fund) से किया जा सकता है।

-19- यह नोट प्रशासनिक अनुमोदन ओर वित्तीय स्वीकृति हेतु प्रस्तुत है।

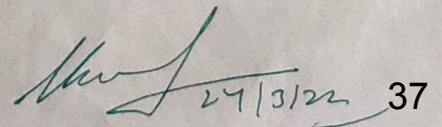

विभागमध्यक्ष,
जंतु विज्ञान विभाग


सुरेश कुमार
आंकड़ा प्रविष्टि कर्ता

अधिष्ठाता,
जीव विज्ञान स्कूल 11/3/22


माननीय कुलपति महोदय जी के अवलोकन व प्रशासकीय अनुमति हेतु फाइल जस्टिस के सूचनीय हेतु प्रस्तुत है कि शैक्षणिक भ्रमण 13 मार्च को करवाया जा रहा है।
माननीय कुलपति महोदय 23/3/22




24/3/22 37

3/13/2022

Educational Tour To Pong Dam At District Kangra (H.P)


विभागाध्यक्ष, जंतु विज्ञान विभाग
Head, Department of Animal Science
हिमाचल प्रदेश केंद्रीय विश्वविद्यालय
Central University of Himachal Pradesh
अस्थायी शैक्षणिक ब्लॉक Temporary Academic Block
शाहपुर, कांगड़ा (जिला) Shahpur, Kangra (H.P)-178206

“All perceiving is also thinking, all reasoning is also intuition, all observation is also invention”

1

Introduction

Field trips are very important for widening the knowledge of students, as they give a practical view of the things that they learn in the classroom. Students learn many new things in the classroom, from their textbooks and their teachers. However, an entirely different experience that teaches children in a unique way is the concept of a field trip. When students go out on field trips, they get a chance to see how the real world functions. No matter at which age or grade, every student loves the idea of going out on field trips. Irrespective of the venue, a field trip is a great educational tool that benefits both the teacher and the taught.

2

Aims And Objectives

On this trip :

- 1) Students will identify and recognise and the various migratory birds.
- 2) Students will know about the taxonomy, behaviour and various activities of the migratory birds.
- 3) Students will ask and answer the questions pertaining to a variety of birds and from where they have migrated.
- 4) Students will be able to distinguish between the migratory birds and the local ones.

3

About the Pong Dam Lake

Maharana Pratap Sagar, also known as Pong Dam Lake is a large reservoir in Fatehpur, Jawali and Dehra tehsil of Kangra district of the state of Himachal Pradesh in India. The lake is a well-known wildlife sanctuary and one of the 27 international wetland sites declared in India by the Ramsar Convention. The reservoir was declared as a bird sanctuary in 1983.

Lakhs of migratory and local birds of more than hundred species have their destination at and around Pong dam lake. The lake has become one of popular places to be visited by the bird watchers, researchers, experts and tourists. Bird Festival is being organised in Pong Dam reservoir by Wildlife wing of the Himachal Pradesh Forest department at Nagrota Surian in Kangra district. Pong Dam Wetland too Hold First Bird Festival On 1st February 2020.



4

Visit and field work

On 13 March 2022, we students of 2nd year attended the bird fair at Sugnara, Pong wild life sanctuary with our respected teachers. The two-day Pong Bird Festival-2022, being organised by the state wildlife wing of the Forest Department at Sugnara, Pong Lake Wildlife Sanctuary and was inaugurated by the Forest, Youth Services and Sports Minister **Rakesh Pathania** on Sunday.



We reached at the Sugnara, Nagrota Surian at about 09:30am. We registered ourselves for participating in various activities like bird watching, photography, quiz competition, cycling and painting competition etc., organised by the department. Then the whole group was divided into small teams. Then we were introduced to our respective guides. One guide was with the each team going for bird watching. We all were very excited about the whole thing.



After participating in the event we went for a lunch which was arranged for us by the Forest Department. After having our lunch we took some rest & chatted with friends. Then, we attended a workshop where wildlife experts acknowledged us with the new things. Dr. Nawin Kumar Tiwari introduced us to world of bird watching and its scopes.



After that prize distribution ceremony was held. We scored 1st, 2nd and 3rd position in different activities. All students were very curious about their prize. So, they opened it & discovered well-known books on birds & wildlife. We also took a group picture along with teachers.

After this great experience, we returned to home by our following routes.

SOME PICTURES OF THE BIRDS SPOTTED AT THE PONG DAM LAKE



Little Ringed Plover

Crested Lark





Indian roller

**Rudy
Shelduck**





Little egret



**Black
Winged Stilt**

**Citrine
wagtail**



White wagtail



5

CONCLUSION

Such field visits can be used not only as a place for exploration and creating curiosity in us, but also as a location for meaningful science instruction. Through the use of engaging, hands-on activities; us, the students can begin to explore our ideas about wild animals and build on these ideas. And by participating in an esteemed educational environment enhanced our enthusiasm in the field of the subject. Hence the impact of a joyful, cheerful and involving day was pretty positively conclusive.

6

ACKNOWLEDGEMENT



First of all, We are thankful to our HOD sir Dr. Sunil Kumar for giving us the permission and opportunity to join such an amazing program. We are heartly thankful to our respected teacher Dr. Amit Kumar Sharma and RD scholar Mr. Kushal Thakur who accompanied us during the whole visit. We are thankful to the respected authorities of Forest Department, Himachal Pradesh for arranging such program and giving us the opportunity. This visit taught us a lot about the diversity and identification of birds. We are thankful to all our professors of the Department of Zoology for their continuous support and encouragement and also helped and guided us a lot.



हिमाचल प्रदेश केन्द्रीय विश्वविद्यालय

Central University of Himachal Pradesh

(Established under Central Universities Act 2009)

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22/11/2024
विषय: दिसम्बर माह में शैक्षणिक भ्रमण (Educational Visit/Study Tour) के लिए प्रशासनिक अनुमोदन और वित्तीय स्वीकृति से सम्बंधित।

-1- जंतु विज्ञान विभाग के स्नातकोत्तर छात्रों (तृतीय सेमेस्टर), से प्राप्त एक अनुरोध पत्र नीचे संलग्न है जिसमें उन्होंने उल्लेख किया है कि उनके पाठ्यक्रम के अनुसार जंगली जानवरों के बारे में अध्ययन करने के लिए Zoological Park छतबीड जू (Chatbir Zoo), जीरकपुर (Zirakpur), चंडीगढ़ में शैक्षणिक भ्रमण करना चाहते हैं।

-2- इसलिए, यह अनुरोध किया जाता है कि, जंतु विज्ञान विभाग के स्नातकोत्तर छात्रों (तृतीय सेमेस्टर) और विभाग की शोध छात्राओं के लिए पाठ्यक्रम के अनुसार जंगली जानवरों के बारे में अध्ययन हेतु शैक्षणिक भ्रमण (Educational Visit/Study Tour) के लिए प्रशासनिक अनुमोदन और निम्नलिखित हेतु वित्तीय स्वीकृति के लिए फ़ाइल को माननीय कुलपति महोदय जी के कार्यालय में प्रेषित करने की कृपा करें।

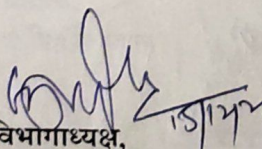
- 3- 1. 33 स्नातकोत्तर विद्यार्थियों, 7 शोध विद्यार्थियों और 04 शिक्षकों और 01 गैर शिक्षण स्टाफ सदस्य के लिए 02 दिन के लिए 01 बस (HRTC) को ले जाने की अनुमति (शाहपुर से चंडीगढ़ और दूसरे दिन शाम को वापसी यात्रा)।

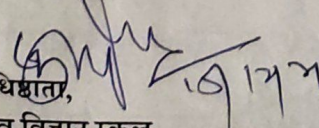
क्र.सं./	विवरण	
1.	शाहपुर से चंडीगढ़	छतबीड जू (Chatbir Zoo), जीरकपुर (Zirakpur), चंडीगढ़
2.	चंडीगढ़ से शाहपुर की यात्रा	

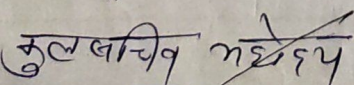
- 4- 2. शैक्षणिक भ्रमण पर हुए पार्किंग (Parking) व्यय और एक रात ठहरने के लिए हुए खर्च को विश्वविद्यालय नियमों के अनुसार भुगतान करने हेतु स्वीकृति और इसके साथ ही विश्वविद्यालय में अनुबंध पर चलाई जा रही बसों में से किसी एक बस को शैक्षणिक भ्रमण के लिए इस्तेमाल करने हेतु स्वीकृति।

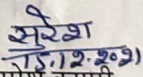
-5- प्रस्तावित अध्ययन हेतु शैक्षणिक भ्रमण (Educational/Study Tour) से संबंधित पूरा खर्च, छात्रों के व्यावसायिक विकास निधि (Professional Development fund) से किया जा सकता है।

-6- यह नोट प्रशासनिक अनुमोदन ओर वित्तीय स्वीकृति हेतु प्रस्तुत है।

-7- 
विभागाध्यक्ष,
जंतु विज्ञान विभाग

-8- 
अधिकाता,
जीव विज्ञान स्कूल

-9- 
कुलपति महोदय


सुरेश कुमार

आंकड़ा प्रविष्टि कर्ता

कमाले प्रकृष्ट पर

रि.सं- 5 में वर्णित वि. वि. द्वारा HRTC से अनुबंध पर चलाई जा रही बसों में से किसी एक बस को शैक्षणिक भ्रमण हेतु ले जाने के लिए लिखा गया है। परंतु पूर्व में भी HRTC द्वारा इस बारे असमर्थता जताई गई थी।
 उक्त माननीय कुलपति महोदय से प्रद निवेदन है कि उपरोक्त उद्देश्य हेतु HRTC से किसी अन्य बस को प्रयोग करने की विधीय एवं प्रशासनिक अनुमति प्रदान करें। साथ ही विभागाध्यक्ष इस संबंध में छात्रों की सुरक्षा भी सुनिश्चित करवाएं। उक्त माननीय कुलपति महोदय जी को अनुमोदनार्थ प्रस्तुत।

- 10 -

Hon'ble VC

15/12/2021

विभागाध्यक्ष कार्यवाही की सूचना हेतु

11-AR(P)

15/12/21

Pr. Singh

रूपा मूल कर्पल के स्वामित्व के कपिल मिश्रा बना उपेक्षित है। 12-

सहायक कुलपति

21/12/21

21/12/2021

अध्यक्षाता जीय विभाग

प्रमुख

- 13 -

विभागाध्यक्ष जंतु विभाग

Zoological Park, Chhatbir

A Field Report:
Vineet Singh

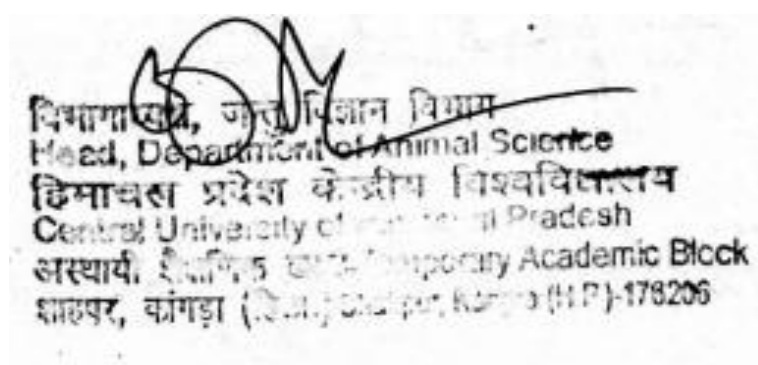
Zoological Park, Chhatbir

by

Vineet Singh

Department Session

MSc. Zoology 2020-2022



Project Head: Dr. Rakesh Thakur
Teaching Assistant: Phd Scholar Kushal thakur
Project Duration: 22-23 Dec. Year-2021
Department: Animal Sciences, CUHP

Preface

“Scientific inquiry starts with observation, the more one can see, the more one can learn”

*Vineet Singh
CUHP, May 2022*

Summary

The zoo can be used not only as a place for exploration and creating curiosity in us, but also as a location for meaningful science instruction. Through the use of engaging, hands-on activities; us, the students can begin to explore our ideas about wild animals and build on these ideas both before and after a zoo field trip. And by participating in an esteemed educational environment enhanced our enthusiasm in the field of the subject. Hence the impact of a joyful, cheerful and involving day was pretty positively conclusive.

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2 About the Zoo	2
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2.1.1 Mammals	3
2.1.2 Aves:	3
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Objectives

Zoological parks are the active sites of wildlife conservation, education, research and recreation. The main objectives of the visit to the zoo are as follows:

Objectives

- To make students observe and learn about the variety of animals their habitats.
- Students will become familiar with animals' behaviour, their diets and daily activities.
- Students will ask and answer questions pertaining to a variety of animals and where they are located on the globe.

1

Introduction

Field trips enrich the curriculum, make connections to what students are learning in classrooms, and provide students with meaningful learning experiences. However, teachers often struggle to find a balance between allowing students the opportunity to freely explore exhibits of their choice for their preferred time periods and making students adhere to a rigid lesson that limits their opportunities to wonder and discover but reinforces or introduces content that fits their curriculum. By providing students with opportunities to explore and develop their science process skills through multi-disciplinary lessons, teachers can help students funnel their curiosity into meaningful learning experiences. The field visit lessons are examples of how to incorporate student curiosity and excitement about the animals.

2

About the Zoo

Chhatbir Zoo (formally known as Mahendra Chaudhary Zoological Park), is a zoological park situated close to Zirakpur, India. Lying on the Chandigarh-Zirakpur-Patiala route, this zoo is located about 20 km away from Chandigarh. The zoo was constructed in the 1970s and is home to a large variety of birds, mammals and reptiles. The zoo is home to 369 mammals, 400 birds and 20 reptiles. Chhatbir has India's longest walk-in aviary with 300m long walk showcases 32 species of indigenous and exotic birds. The section is made in five different themes included Terrestrial, Rock & Duck, Woodland, Japanese Trail and Rainforest.



Figure 2.1: Map of Chhatbir Zoo

2.1. Zoo residents:

Most of the zoo animals are either acquired from other zoos or their offsprings. The objective of the zoo has not been to collect the animals from the wild except the ones which are rescued. The animals are kept as far as possible in open enclosures wherein their behavioural and physical needs can be met. The following categories of animals, birds and reptiles are displayed in the zoo.

2.1.1. Mammals

- **Primates:** Rhesus macaques, Assamese macaques, Bonnet macaques, Pig tailed macaques, Lion tailed macaques, Common langur, Capped langurs and Hamadryas Baboon.
- **Cats:** Royal Bengal Tiger, Leopards, Indian lion, Jungle cat, Jaguar.
- **Civets:** Large Indian Civet.
- **Hyenas:** Striped hyena.
- **Dog family:** Jackal and Indian wolf
- **Bears:** Asiatic black bear, Sloth bear.
- **Weasels:** Smooth Indian otter
- **Rodents:** Indian porcupine
- **Elephants:** Indian Elephants
- **Antelopes:** Black buck, Blue bull and white buck & Chauginga.
- **Gazelles:** Chinkara
- **Deer:** Sambar, Hog deer, Barking deer, spotted deer, Swamp deer, Brown antlered deer, Fellow Deer and Mouse Deer.
- **Pig:** Wild boar
- **Exotics:** Hippopotamus, Zebra, Fellow Deer, Black Swan, Sulphur cockatoo etc.

2.1.2. Aves:

The main **Aves** that exhibits are:

- Sarus crane, Red jungle fowl, Kalij pheasant, aquatic ducks, peacock, partridges, quails.
- Rose ringed parakeet, blossom headed parakeet, pelicans, cranes, storks, budgerigars, and doves.
- The pheasants constitute Golden pheasant, Mongolian ring pheasant, Silver Pheasant.
- The exotics include Ostrich, Emu, Sulphur crested cockatoo, grey cockatiel etc.

2.1.3. Reptiles:

- Gharial, Crocodile,
- Tortoise, Python
- Snakes

3

At the Zoo:

On 22nd of December early morning, we all students of 2nd year left for the Chandigarh together with our respected teachers. We reached at the Chhatbir zoo at about 1:00 pm. There we bought tickets to the zoo and before entering the zoo, we were told to maintain discipline. The whole team was divided into two small groups. Then we started the zoo tour. We all were very excited about the whole thing. We started our tour with our teacher with necessary tools like (pen paper, notepad & camera etc.) for observing animals.

3.1. Details of various animals we observed at the zoo are as follows:

3.1.1. Mammals:

Royal Bengal Tiger (Nav):

- Acquired from Indore Zoo.
- They are powerful nocturnal hunters that travel many miles to find buffalo, deer, wild pigs, and other large mammals.
- Tigers use their distinctive coats as camouflage.
- They lie in wait and creep close enough to attack their victims with a quick spring and a fatal pounce.



Figure 3.1: Caption

White Tiger (Gauri):

- Acquired from Rajkot Zoo
- They're simply tigers that are born with white fur.
- White fur is a very rare genetic mutation.
- It occurs in the wild possibly in as few as 1 in 10,000 wild tiger births.
- Normal tiger behavior in the wild prevents the kind of inbreeding that would be necessary to produce white cubs.



Figure 3.2: White Tiger(Gauri)

HIPPOPOTAMUS:

- After the elephant and rhinoceros, the hippopotamus is the third-largest land mammal and is the heaviest extant land artiodactyl.
- Hippos inhabit rivers, lakes, and mangrove swamps.
- During the day, hippos remain cool by staying in water or mud, emerging at dusk to graze on grasses.
- Hippos are among the most dangerous animals in the world due to their highly aggressive and unpredictable nature.
- They are threatened by habitat loss and poaching for their meat and ivory (canine teeth).



Figure 3.3: Hippopotamus

LEOPARDS:

- *Panthera pardus* is listed as Vulnerable on the IUCN Red List because populations have declined following habitat loss and fragmentation, poaching for the illegal trade of skins and body parts, and persecution due to conflict situations.
- The Indian leopard is one of the big cats occurring on the Indian subcontinent, along with the Asiatic lion, Bengal tiger, snow leopard and clouded leopard.[2][3][4] In 2014, a national census of leopards around tiger habitats was carried out in India except the northeast. 7,910 individuals were estimated in surveyed areas and a national total of 12,000-14,000 speculated.
- The Indian leopard has strong legs and a long well-formed tail, broad muzzle, short ears and small, yellowish grey eyes, light grey ocular bulbs.

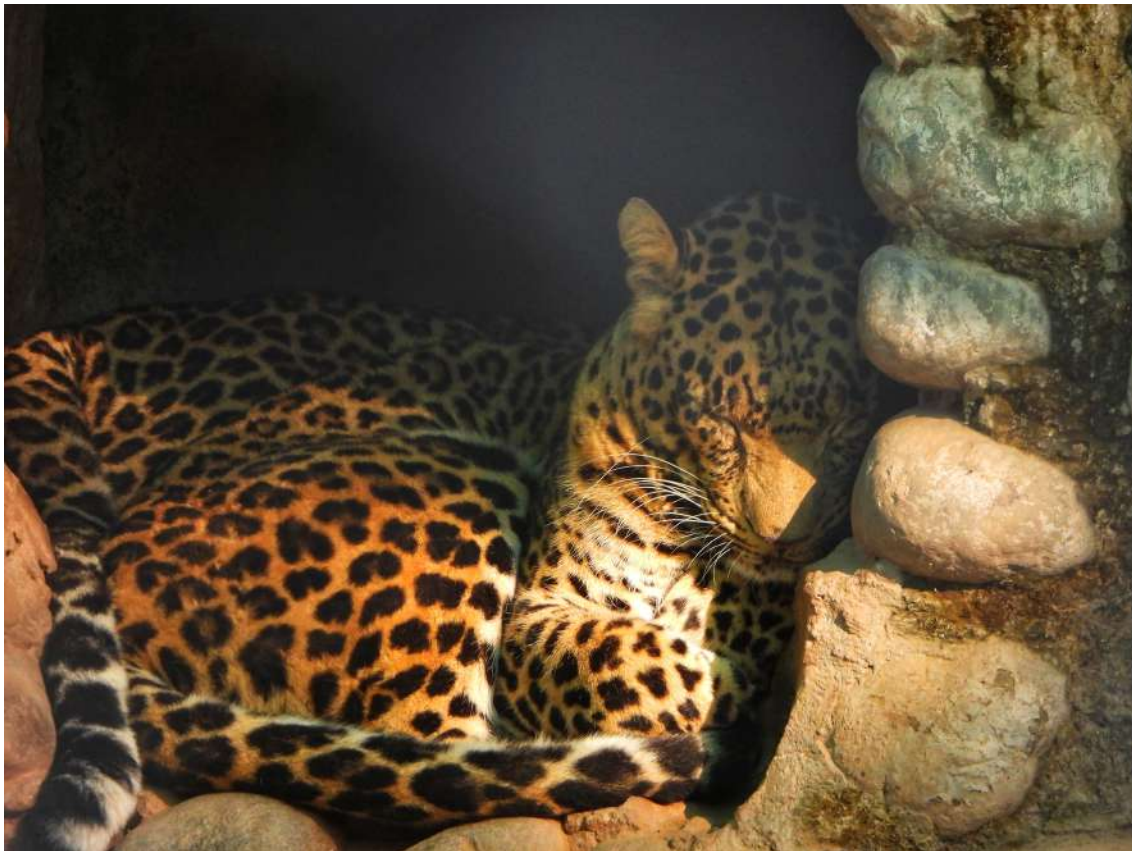


Figure 3.4: Leopard

JUNGLE CAT:

- The jungle cat (*Felis chaus*), also called reed cat and swamp cat, is a medium-sized cat.
- It inhabits foremost wetlands like swamps, littoral and riparian areas with dense vegetation.
- The jungle cat has a uniformly sandy, reddish-brown or grey fur without spots; melanistic and albino individuals are also known.
- It is solitary in nature, except during the mating season and mother-kitten families.



Figure 3.5: Jungle Cat

STRIPED HYENA:

- The striped hyena (*Hyaena hyaena*) is a species of hyena native to North and East Africa, the Middle East, the Caucasus, Central Asia and the Indian subcontinent.
- It is the only extant species in the genus *Hyaena*.
- The striped hyena has a fairly massive, but short torso set on long legs.
- Body length can range from 85 to 130 cm (33 to 51 in), not counting a tail of 25 to 40 cm (9.8 to 15.7 in), and shoulder height is between 60–80 cm (24–31 in).



Figure 3.6: Striped Hyena

INDIAN FOX:

- The Bengal fox (*Vulpes bengalensis*), also known as the Indian fox, is a fox endemic to the Indian subcontinent from the Himalayan foothills and Terai of Nepal through southern India, and from southern and eastern Pakistan to eastern India and southeastern Bangladesh.
- The Bengal fox is more daintily built than the red fox (*V. vulpes*), and can readily be recognized by its bushy, black-tipped tail, which is around 50–60% of the length of the head and body.



Figure 3.7: Striped Hyena

INDIAN MUNTJAC:

- The Indian muntjac is also called "barking deer" due to the bark-like sound that it makes as an alarm when danger is present. It is also called Kakar. Other than during the rut (mating season) and for the first six months after giving birth, the adult Indian muntjac is a solitary animal.
- It has soft, short, brownish or greyish hair, sometimes with creamy markings. This species is omnivorous, feeding on grass, fruits, shoots, seeds, birds' eggs as well as small animals.



Figure 3.8: Indian Muntjac

INDIAN GAZELLE:

- It lives in grasslands and desert areas in the Republic of India, Bangladesh and parts of Iran and Pakistan.
- According to the IUCN Red List, the total population size of Chinkara is around 50,000-70,000 mature individuals.



Figure 3.9: Indian Gazelle

WHITE BUCK:

- Albinism in Blackbuck is rare and caused by the lack of the pigment melanin. The animal looks fully white due to the lack of melanin in their skin. Wildlife experts say that the biggest problem with these Albinos is that they are singled out by predators and hunted. The distinctive horns of the Blackbuck are ringed with 1 to 4 spiral turns, rarely more than 4 turns, and can be as long as 79 cm (31 in). In the male, the upper body is black (dark brown), and the belly and eye rings are white. The light-brown female is usually hornless.



Figure 3.10: White Buck

SPOTTED DEER:

- The chital is a moderately sized deer. Males reach nearly 90 cm (35 in) and females 70 cm (28 in) at the shoulder; the head-and-body length is around 1.7 m (5 ft 7 in). While immature males weigh 30–75 kg (66–165 lb), the lighter females weigh 25–45 kg (55–99 lb). Mature males can weigh up to 98 to 110 kg (216 to 243 lb). The tail, 20 cm (7.9 in) long, is marked by a dark stripe that stretches along its length. The species is sexually dimorphic; males are larger than females, and antlers are present only on males.
- The chital ranges over 8–30°N in India and through Nepal, Bhutan, Bangladesh, and Sri Lanka.[3] The western limit of its range is eastern Rajasthan and Gujarat. The northern limit is along the Terai belt of the foothills of the Himalaya and from Uttar Pradesh and Uttaranchal through to Nepal, northern West Bengal and Sikkim and then to western Assam and the forested valleys of Bhutan, which are below an elevation of 1,100 m (3,600 ft).
- Chital occur sporadically in the forested areas throughout the rest of the Indian peninsula.

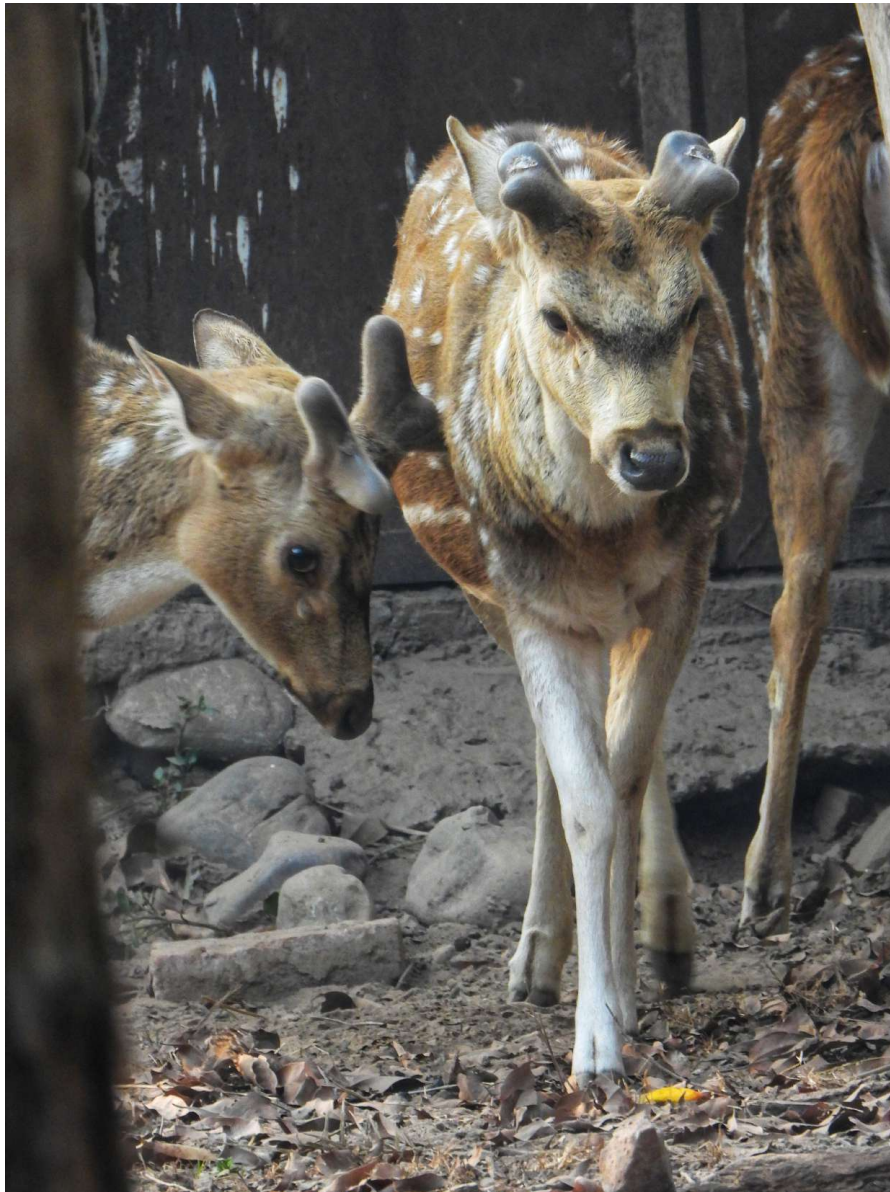


Figure 3.11: Spotted Deer

ELEPHANT:

- The Indian elephant is native to mainland Asia: India, Nepal, Bangladesh, Bhutan, Myanmar, Thailand, Malay Peninsula, Laos, China, Cambodia, and Vietnam. It is regionally extinct in Pakistan.
- It inhabits grasslands, dry deciduous, moist deciduous, evergreen and semi-evergreen forests. In the early 1990s, the estimated wild populations included:
- 27,785–31,368 in India, where populations are restricted to four general areas.
- Northwest, Northeast, Central Part, South.



Figure 3.12: Elephant

3.1.2. Aves:

Birds are a group of warm blooded vertebrates constituting the class Aves. Characterised by feathers, toothless beaked jaws, the laying of hard-shelled eggs, a high metabolic rate, a four-chambered heart, and a strong yet lightweight skeleton. Birds live worldwide and range in size from the 5.5 cm (2.2 in) bee hummingbird to the 2.8

S. No.	Mammals	IUCN Status
1.	Royal Bengal Tiger	Endangered
2.	White Tiger	Endangered
3.	Leopard	Vulnerable
4.	Jungle Cat	Critically Endangered
5.	Hippopotamus	Vulnerable
6.	Indian Fox	Least Concern
7.	White Buck	Least Concern
8.	Elephant	Endangered
9.	Spotted Deer	Least Concern
10.	Striped Hyena	Near Threatened
11.	Indian Gazelle	Least Concern
12.	Indian Muntjac	Least Concern

Table 3.1: IUCN status

m (9 ft 2 in) ostrich. There are about ten thousand living species, more than half of which are passerine, or "perching" birds.



Figure 3.13

The main aves exhibits are Sarus crane red jungle fowl, Kalij pheasant, aquatic ducks, peacock, partridges, quails, rose ringed parakeet, blossom headed parakeet, pelicans, cranes, storks, budgerigars, and doves. The pheasants constitute Golden pheasant, Mongolian ring pheasant, Silver Pheasant. The exotics include Ostrich, Emu, Sulphur crested cockatoo, grey cockatiel etc.

Black-crowned night heron:

- These birds stand still at the water's edge and wait to ambush prey, mainly at night or early morning.

- They primarily eat small fish, crustaceans, frogs, aquatic insects, small mammals, and small birds.
- They are among the seven heron species observed to engage in bait fishing; luring or distracting fish by tossing edible or inedible buoyant objects into water within their striking range – a rare example of tool use among birds.



Figure 3.14: Black Crowned night Heron

Sarus crane:

- While many other cranes make long migrations, sarus cranes are largely nonmigratory, although some populations do migrate short distances.
- The first is the "wintering population" of a small number of sarus cranes that use wetlands in the state of Punjab during winters.
- The source of this population is unclear, but is very likely to be from the growing population in Himachal Pradesh.
- The second is the "expanding population" consisting of cranes appearing in new areas following new irrigation structures in semiarid and arid areas primarily in Gujarat and Rajasthan.
- The third is the "seasonally migratory" population, also primarily in the arid zone of Gujarat and Rajasthan.



Figure 3.15: Black Crowned night Heron

SPOT-BILLED DUCK:

- It is a bird of freshwater lakes and marshes in fairly open country and feeds by dabbling for plant food mainly in the evening or at night.
- The breeding season varies with rainfall and water condition but is July to September in northern India and November to December in southern India.
- Multiple broods may be raised. It nests on the ground hidden within in vegetation near water, and lays 8-14 eggs.
- Nests have sometimes been seen on tree branches covered by creepers. Incubation begins after the last egg is laid (allowing the chicks to hatch simultaneously) and the young hatch after about 24 days.
- The chicks are black with a yellow back and resemble those of mallards but with a wider eye-stripe.



Figure 3.16: Spotted-Billed Duck

Great-white pelican:

- The great white pelican is highly sociable and often forms large flocks.
- It is well adapted for aquatic life. The short strong legs and webbed feet propel it in water and aid a rather awkward takeoff from the water surface.
- In flight, it is an elegant soaring bird, with the head held close to and aligned with the body.
- Its flight consists of a few slow wingbeats followed by a glide.
- Once aloft, the long-winged pelicans are powerful fliers, however, and often travel in spectacular linear, circular, or V-formation groups.

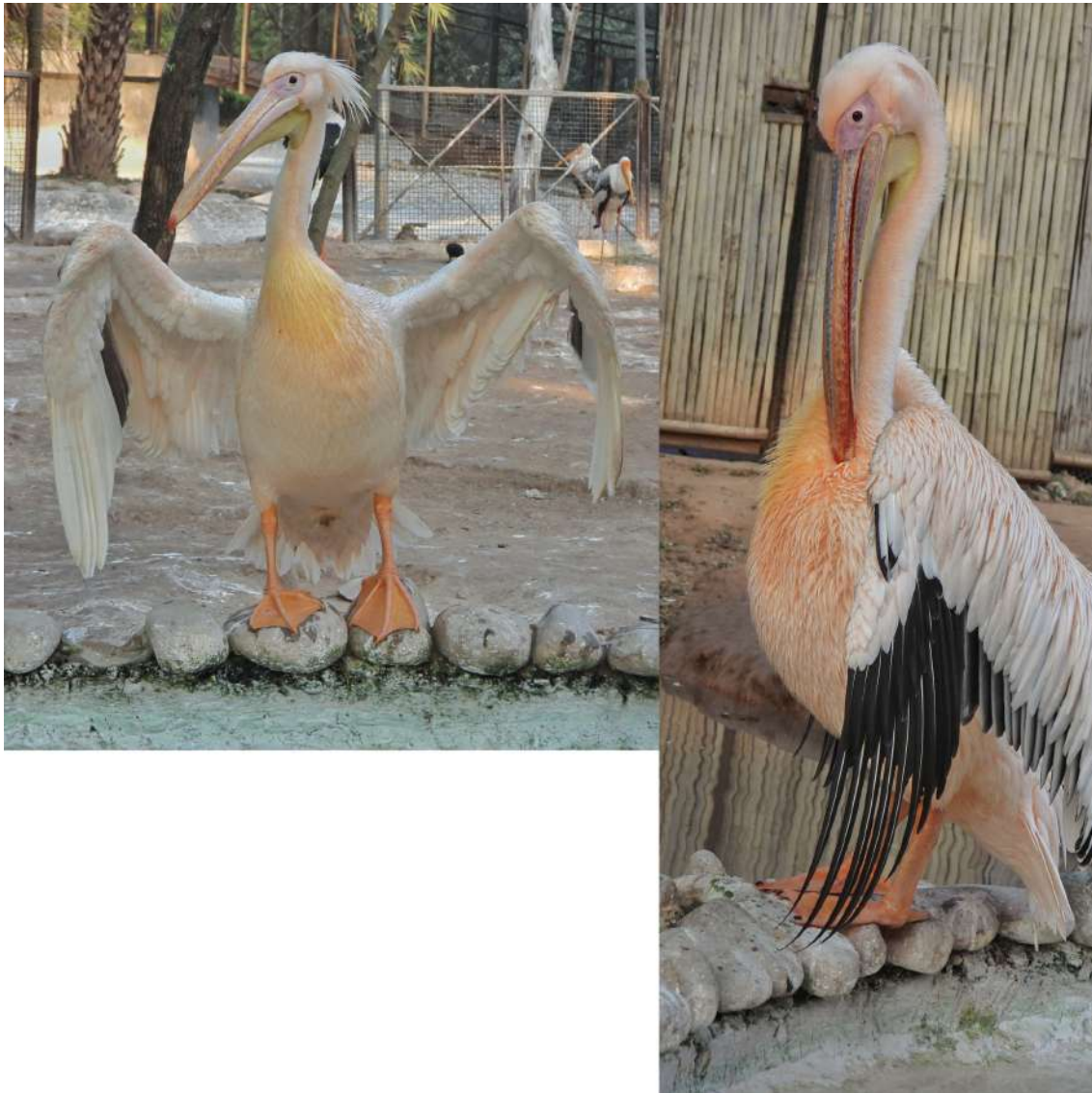


Figure 3.17: Great White Pelican

Great cormorant:

- The great cormorant is a large black bird, but there is a wide variation in size in the species' wide range.
- Males are typically larger and heavier than females.
- It is similarly larger and bulkier than double-crested cormorant, and the latter species has more yellow on the throat and bill and lacks the white thigh patches frequently seen on great cormorants.
- A very rare variation of the great cormorant is caused by albinism. The *Phalacrocorax carbo albino* suffers from poor eyesight and/or hearing, thus it rarely manages to survive in the wild.
- This is a very common and widespread bird species.
- It feeds on the sea, in estuaries, and on freshwater lakes and rivers.
- Northern birds migrate south and winter along any coast that is well-supplied with fish.

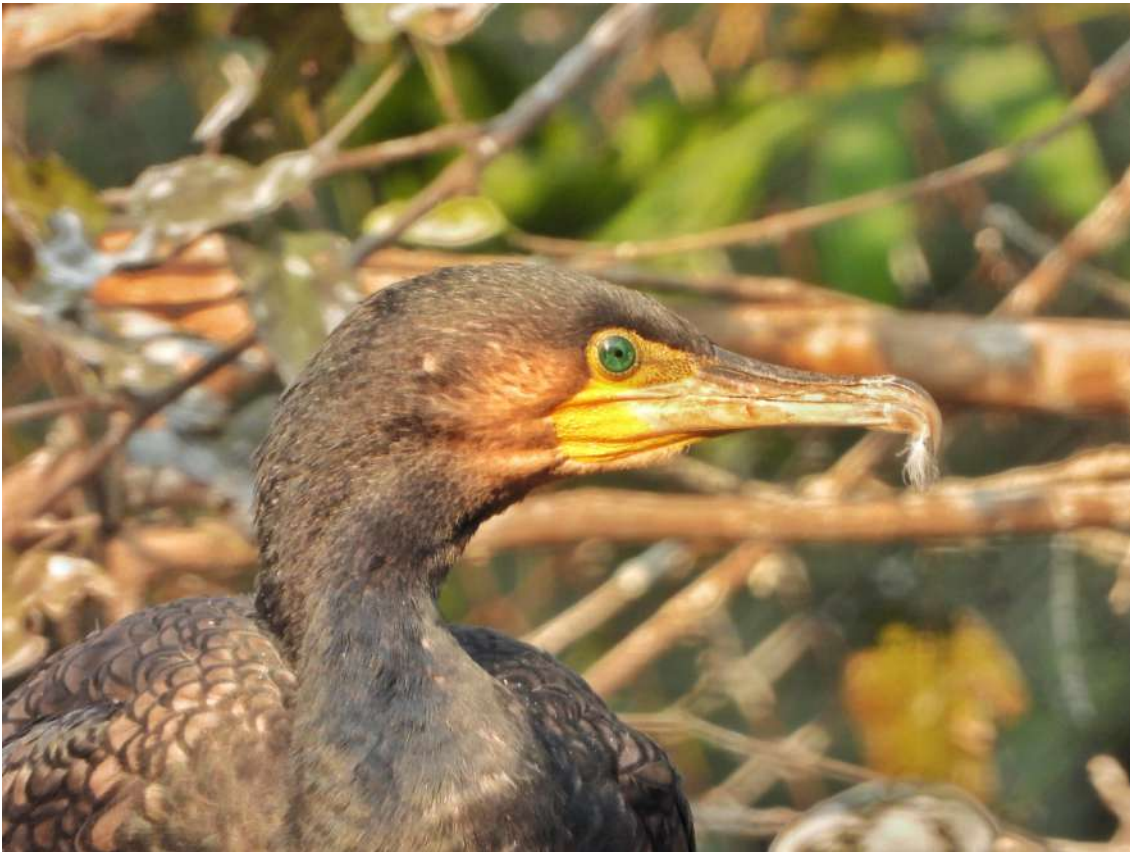


Figure 3.18: Great cormorant

Domestic goose:

- Domestic geese have been selectively bred for size, with some breeds weighing up to 10 kilograms.
- Geese produce large edible eggs, weighing 120–170 grams.
- they can be used in cooking just like chicken's eggs, though they have proportionally more yolk, and this cooks to a slightly denser consistency. The taste is much the same as that of a chicken egg, but gamier.
- Geese have also been strongly selected for fecundity, with females laying up to 50 eggs per year, compared to 5–12 eggs for a wild goose.



Figure 3.19: Domestic Goose

Alexandrine parakeet:

- The Alexandrine parakeet (*Psittacula eupatria*), also known as the Alexandrine parrot, is a medium-sized parrot in the genus *Psittacula* of the family *Psittaculidae*.
- The Alexandrine parakeet lives in forests, woodlands, agricultural lands and mangrove forests at elevations of up to 900 m (3,000 ft).
- It eats a variety of wild and cultivated seeds, buds, fruits and nuts. Flocks can cause extensive damage to ripening fruits and grain crops like maize and jowar.
- It usually lives in small flocks, but forms larger groups in areas where food is abundant or at communal roosts.



Figure 3.20: Alexandrine parakeet

Peafowl:

- Peafowl is a common name for three bird species in the genera *Pavo* and *Afropavo* within the tribe Pavonini of the family Phasianidae, the pheasants and their allies. Male peafowl are referred to as peacocks, and female peafowl are referred to as peahens, even though peafowl of either sex are often referred to colloquially as "peacocks".
- Peafowl are forest birds that nest on the ground, but roost in trees. They are terrestrial feeders.
- All species of peafowl are believed to be polygamous. In common with other members of the Galliformes, the males possess metatarsal spurs or "thorns" on their legs used during intraspecific territorial fights with some other members of their kind.



Figure 3.21: Peafowl

Emu:

- Emus are diurnal birds and spend their day foraging, preening their plumage with their beak, dust bathing and resting.
- They are generally gregarious birds apart from the breeding season, and while some forage, others remain vigilant to their mutual benefit.
- They are able to swim when necessary, although they rarely do so unless the area is flooded or they need to cross a river.



Figure 3.22: Emu

Red jungle fowl:

- Red junglefowl regularly bathe in dust to keep the right balance of oil in their plumage. The dust absorbs extra oil and subsequently falls off.
- Flight in these birds is almost purely confined to reaching their roosting areas at sunset in trees or any other high and relatively safe places free from ground predators, and for escape from immediate danger through the day.
- Redjunglefowl are attracted to areas with ripe fruit or seeds.
- Although junglefowl typically eat fallen fruits and seeds on the ground, they occasionally forage in trees by perching on branches and feeding on hanging fruit.



Figure 3.23: Red jungle Fowl

A

CONCLUSION

The zoo can be used not only as a place for exploration and creating curiosity in us, but also as a location for meaningful science instruction. Through the use of engaging, hands-on activities; us, the students can begin to explore our ideas about wild animals and build on these ideas both before and after a zoo field trip. And by participating in an esteemed educational environment enhanced our enthusiasm in the field of the subject. Hence the impact of a joyful, cheerful and involving day was pretty positively conclusive.

B

ACKNOWLEDGMENT

At first, We are thankful to our HOD Dr. Sunil Kumar sir for giving us the permission to go on such a visit and respected professor Dr. Rakesh Thakur who accompanied us in this tour. We are also grateful to our RD scholar Kushal sir who guided us throughout the journey. We are grateful to our friends for their help to prepare this project report. This project taught us a lots about ex-situ conservation and wildlife. We are thankful to all our professors of the Department of Animal science for their continuous support and encouragement and also helped and guided us a lot to complete this project Report.