



Two days
Hands-on Workshop on

“Separation and Characterization Techniques of Soil and Aquatic Biota”

Primarily focused on
[Apterygotes, Nematodes, Earthworms, and Fishes]

Jointly Organized by

Zoological Survey of India
Kolkata
(West Bengal)

Dr. Harisingh Gour Vishwavidyalaya
(A Central University)
Sagar (M.P.)



Patron

Dr. Dhriti Banerjee
Director, Zoological Survey of India,
Ministry of Environment, Forests & Climate
Change, Government of India,
Kolkata (W.B.)



Patron

Prof. Neelima Gupta
Hon'ble Vice-Chancellor
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(A Central University)
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Coordinator, ZSI

Dr. Anjum N. Rizvi
Senior Scientist
Zoological Survey of India,
Kolkata (West Bengal)



Coordinator, DHSGVV

Prof. Shweta Yadav
Head, Department of Zoology
Dr. Harisingh Gour Vishwavidyalaya
Sagar (M.P.)



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Two days Hands-on Workshop on

“Separation and Characterization Techniques of Soil and Aquatic Biota”

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A two-days hands-on workshop was organized by the Department of Zoology, Dr. Harisingh Gour Vishwavidyalaya (A Central University) Sagar, Madhya Pradesh entitled “Separation and Characterization Techniques of Soil and Aquatic Biota” on 6-7th March, 2024. The main focus was on apterygotes, nematodes, earthworms, and fishes.

The program was formally inaugurated by Prof. Neelima Gupta, Hon'ble Vice Chancellor, Dr. Harisingh Gour Vishwavidyalaya (A Central University) Sagar, Madhya Pradesh and the Chief Guest Prof. D. P. Gupta, Former Head, Department of Zoology on 6th March, 2024 at Seminar Hall of the Dept of Zoology. Dr. Anjum Rizvi, Scientist-E, Coordinator of MoU from Zoological Survey of India (ZSI), Kolkata, West Bengal, Prof. H. Thomas, Director of Research & Development, Coordinator of MoUs of the University, Guest of Honor Prof. Smita Banerjee, former Head Department of Zoology, Prof. U. S. Gupta former Head Department of Zoology, Prof. Subodh Kumar Jain, Former Head, Dept. of Zoology, Prof. Ajeet Jaiswal, Director Faculty Affairs, Prof. M. L. Khan, Head, Dept of Botany, Prof. Versha Sharma, Dean School of Biological Sciences (SBS), and Prof. Shweta Yadav, Coordinator of MoU and Head, Dept of Zoology were present. As a token of gratitude, plant samplings were presented to the guests as an ecofriendly approach.





View of Guests at Inaugural Session on 6th March, 2024



Prof. Neelima Gupta, Hon'ble Vice-Chancellor, Dr. Harisingh Gour Vishwavidyalaya, Sagar addressing the gathering of inaugural session on March 6th 2024.



Glimpse of audience in inaugural Session

This workshop, "Separation and Characterization Techniques of Soil and Aquatic Biota" was intended to train M.Sc. and Ph.D. students of the department, where the main focus was on apterygotes, nematodes, earthworms, and fishes.

Prof. Shweta Yadav briefed about the selection of the organisms based on their importance in the soil and aquatic ecosystems. She submitted to the house that Soil apterygotes, nematodes, and earthworms play an important role in the decomposition of plant litter and the formation of the microstructure of soil. Usually, when we think about insects, our attention is directed towards the pterygotes, especially the beautiful butterflies, colourful beetles, and many more. But there is another important group of class insecta, which is apterygote. It is the primitive subclass of Insecta comprising of Thysanura, Collembles, Diplurans, and Proturans. Among them, collembles, or spring tails, are known for recycling the dead material and feeding on microbes. They improve structure of the soil as well as make nutrients available to plants. She appreciated the consent given by Dr. Gurupada Mandal, Zoological Survey of India to demonstrate the techniques. Despite its importance to the soil ecosystem, limited numbers of scientists are working in this area. He informed the house that the Bundelkhand region is unexplored for soil apterygotes as well as soil nematodes.



After joining of Hon'ble Vice Chancellor Prof. Neelima Gupta to this University, it always reminds me of her discoveries on soil nematodes and fish parasites. For which she was honoured with the Janaki Ammal **National Award for Taxonomy** by the **Zoological Survey of India**. Hon'ble Vice Chancellor is a role model for every student studying Zoology, Taxonomy, and Ecological Sciences in this department.

In terms of soil nematodes, a lot of work has been carried out in India, especially under the umbrella of Hon'ble Prof. M. Shamim Jairajpuri. But a lot still has to be explored. Sometimes, nematodes are useful for soil functioning, but on the other hand, they are harmful to plants and other soil fauna. The extraction of nematodes from the soil is a challenge because when we collect the soil samples, many other organisms including the soil microdrilli (aquatic oligochates) also come out along with the nematodes, and they look similar. After the discussion with Coordinator ZSI, Dr. Anjum Nasreen Rizvi, we planned to teach our students, the separation techniques and fundamental parameters to characterise them, so that our students may also contribute in exploring the Nematodes of the Bundelkhand Region.

Further, on studying the soil organism, the first name that comes to mind is an earthworm. That was called an "Intestine of Soil" by Greek philosopher Aristotle about 2400 years ago. India holds 459 species of earthworms, of which 7 are Incertae sedis status. If we compare the total landmass of India in comparison to the world, it occupies only 2 percent, while in terms of earthworm diversity, our country holds 10 percent of diversity, where a larger section of India is either unexplored or underexplored. The department appreciated the contribution in training by Dr. Sakoor Ahmad to demonstrate the earthworm characterization techniques.

Further, the fisheries sector of India plays a significant role in the economy. It contributes 3% of GDP, 11% of export earnings, and 5% of employment. But at the same time, parasites on fish cause a 6–16% loss in aquaculture production costs, which results in to loss of 3000 million INR. Nevertheless, we are the third-largest fish-producing country after China and Indonesia. The possibility of our students contributing to this important sector of biology is included in the workshop, for which Hon'ble Vice Chancellor Prof. Neelima Gupta is known globally. Fortunately, we have Prof. Janardan Prasad Shukla from Indira Gandhi Tribal University, Amarkantak, who is known for his popular book, Fish and Fisheries. The department feels privileged to have him in this workshop.





As we know, taxonomy is the science of organising and classifying organisms. It plays an important role in theoretical as well as applied biology. Over 2400 years ago, Aristotle gave the first classification of organisms and divided them into two groups, Animals and Plants, on the basis of their physical state. Later on, Swedish naturalist Carolus Linnaeus introduced the binomial system, which is a universally and still accepted system of classification. After Linnaeus, approximately 1.78 million species have been identified, and it is estimated that only 5–10% of the total fauna has been described so far. In recent years, it has been found that only morphological characters may not always be sufficient to determine the genetic and evolutionary relationship between different taxa. Therefore, many other disciplines, like anatomy, embryology, cytology, and molecular biology, are now being considered to provide additional evidence for describing species. But these molecular tools provide only the additional evidence, and cannot replace classical techniques, and therefore this workshop has been planned for the students of biological sciences.

In the last few decades, unfortunately, taxonomy has been undervalued and misunderstood. Prof. Yadav underlined the importance of taxonomy before taxonomists, Hon'ble Vice-chancellor Prof. Neelima Gupta, Dr. Anjum N. Rizvi, Dr. G. Mandal and Prof. J.P. Shukla. It is a complex process that requires comprehensive analysis to designate a taxon at a particular hierarchy.

Therefore, the workshop was planned to strengthen our students in the field of taxonomy, from where many branches of biology lineage. In this workshop, 66 Participants are registered. The majority of them are pursuing post-graduation in our department, while a few PhD students have also registered. This year, our M.Sc. IV semester students have to pursue dissertation for the very first time, and we suppose this workshop will help some of them for their dissertation work in ZSI.

She also took the opportunity to thank Hon'ble Vice-chancellor Prof. Neelima Gupta for providing non-teaching staff to the department, and now also we are looking forward to have teaching staff. She considered the current period to be the Golden Period for the department since a brilliant Zoologist is sitting on the driving seat as Vice Chancellor and department gets the blessings and guidance of our Senior professors as and when required. She also thanked all senior professors, including Prof. DP Gupta, Prof. Smita Banerjee, and Prof. US Gupta, for joining this workshop and active participation and guidance of Prof Subodh Kumar Jain.





Prof. Shweta Yadav, Head and the Coordinator of MOU-ZSI introduced about the Workshop



View of Guests and audience during the inaugural Session

Prof. H. Thomas, Coordinator of MOUs and Director of Research & Development addressed the gathering. He told that there are two important organizations in India i.e., GSI (Geological Survey of India) which is 175 years old, and ZSI (Zoological Survey of India) which is 108 years old. We feel proud and privileged that we have collaboration with both these organizations. He also, informed about the sophisticated instrumentation facility of the university.



**Prof. H. Thomas, Director of Research and Development
addressing the gathering**

Dr. Anjum N. Rizvi, (coordinator ZSI-MOU) in her address highlighted the key role of two important persons Prof. Neelima Gupta, Hon'ble Vice Chancellor DHSGU and Dr. Dhriti Banerjee, Director ZSI, Kolkata. Further she introduced the working of Zoological Survey of India. She told that ZSI is documenting faunal diversity of India, and also, ZSI is the custodian of zoological specimens and records.



Dr. Anjum N. Rizvi, Scientist- E ZSI, Kolkata addressing the gathering

Further, the Chief Guest Prof. D. P. Gupta, former Head Department of Zoology, DHSGU, expressed his immense happiness to see the upgradation of the department. Also, he emphasized and added the participants to work in the field of integrated technology along with systematics and taxonomy for betterment of the society.



Chief Guest Prof. D. P. Gupta addressing the gathering

Prof. Neelima Gupta, Hon'ble Vice-Chancellor, Dr. Harisingh Gour Vishwavidyalaya, Sagar enlightened the audience with her presidential address. During her address Prof. Gupta grabbed the audience focus on MOUs signed by the University, she informed that our university has signed 69 MOUs which are being taken care by Prof. H. Thomas DORD. About the experts she introduced Prof. J. P. Shukla, IGNTU, Amarkantak that he was awarded Saraswati Samman (Govt. of U.P.) for his extraordinary work in the research field of aquatic fauna especially fisheries. As, Hon'ble Prof. Gupta is also from the subject Zoology and her specialization is parasitology, she highlighted the importance of parasitology and said that "Parasitology is a chance phenomenon". And thus, it is always very much challenging to work in the field of taxonomy and identification, but we are fortunate enough that ZSI experts are with us to get us trained in identification of soil and aquatic biota. Further, she said for the department of Zoology, ZSI is the best collaborator. According to NEP 2020, the key role is collaborations and appreciated Prof. Shweta Yadav, Head, Department of Zoology for her active role as a coordinator.



A view of gathering during inaugural session of the workshop

Later, the dignitaries were felicitated with Srfal, Shawl and a Memento.



A view of felicitating the dignitaries

Dr. Payal Mahobiya, Department of Zoology proposed the vote of thanks and Ms. Garima Stephen, Research Scholar, Department of Zoology, conducted the inaugural session.



Dr. Payal Mahobiya proposed the vote of thanks



Dignitaries and participants during inaugural session (March 6, 2024)

March 6, 2024, Day 1: Technical Session I

The first technical session was chaired by Prof. Smita Banerjee, former Head, Department of Zoology, DHSGU Sagar and the Rapporteur Dr. Nalini Tiwari, Research Associate, conducted by Ms. Kainat Usmani.

The session started with an expert lecture by Dr. Anjum N. Rizvi, Scientist-E, ZSI, Kolkata on "**Collection, Preservation & Identification of Soil nematodes**". She introduced the participants about the total world diversity of nematodes which is 26646 recorded species. Also, she explained the positive and negative role of nematodes that categorize the nematodes into good and bad. Good nematodes are those which have antipathogenic activity, they serve as models while bad nematodes cause damage to plants and also cause several diseases in animals and humans. For collecting the soil nematodes, one has to remove the upper layer then take 20-30 sub-samples. Collection can be made with the help of soil corers. Also, precautions are to be taken during the collection like removing air bubbles before packing the sample in the field. Nematodes are also a good indicator of disturbance. If omnivorous animals are reduced, it shows the first level of disturbance while when predatory nematodes are diminished it shows the second level of disturbance. Lastly, if one gets only bacterial nematodes, it means the site is highly disturbed.





**Expert lecture by Dr. Anjum N Rizvi, Senior Scientist
ZSI, Kolkata and responding the queries**



**Prof. Smita Banerjee, Chairperson of the session
sum up the expert lecture**

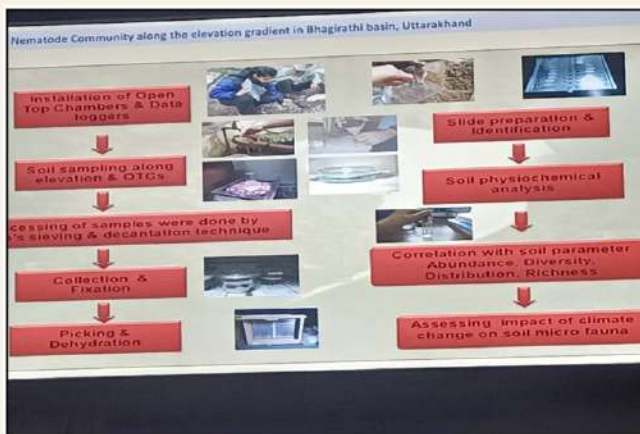
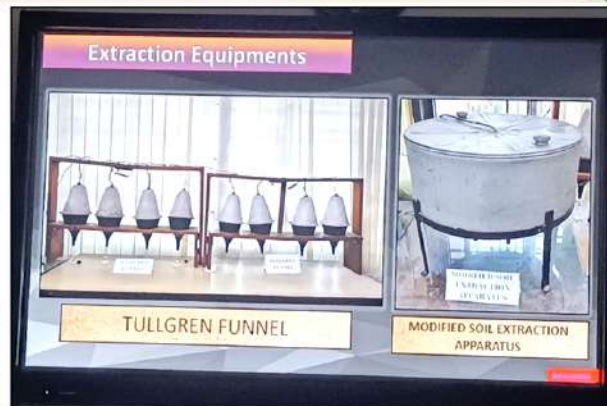


6th March, 2024 Wednesday: Technical Session II

Second technical session was chaired by Prof. Subodh Jain, Former Head, Department of Zoology and Rapporteur was Mr. Praddum Namdev, Research Scholar and conducted by Ms. Ankita Diwedi, Research Scholar.

The speaker Dr. Guru Pada Mandal, Officer-in-charge and Scientist-E, Zoological Survey of India, delivered a lecture entitled "**Separation and Characterization Techniques of Apterygote Fauna.**" Dr. Mandal introduced apterygotes, explaining that they are small hexapods lacking wings, with the term "apterygote" derived from the Greek word "apterygotes" meaning wingless. He covered the systematics of apterygotes, highlighted their economic importance and why studying them is crucial. The lecture provided insights into the diverse habitats and niches occupied by different orders of apterygotes, supported by pictorial presentation. He then introduced various collection techniques and equipment used for sampling apterygotes, including; Beating bushes or mosses, Floating technique, Tullgren funnel technique etc. After discussing collection methods, he explained wet and dry preservation techniques for the collected samples. He emphasized the importance of proper labelling and introduced temporary and permanent labelling methods, supported by pictorial representations and videos of collection sites and methods. The lecture concluded by covering the identification characters of four orders of the subclass Apterygota. Dr. Mandal also discussed recent research, new records identified by ZSI scientists, and recent publications from ZSI in this field. The well-structured lecture familiarized the students with various aspects of apterygote study. During the interactive session, participants asked questions, which Dr. Mandal addressed patiently and comprehensively. Overall, the technical session provided a detailed overview of apterygote fauna, covering their systematics, economic importance, collection techniques, preservation methods, labelling, identification, and recent advancements in the field.





Visual Representations by Dr. Guru Pada Mandal

Laboratory Demonstration of First Technical Session

Experiment 1: Dr. Anzum N. Rizvi, Senior Scientist, ZSI, Kolkata performed and demonstrated an experiment on Collection, Preservation & Identification of Soil nematodes in two batches in different laboratories. Later on, a student participant also performed and learned the identification of soil nematodes under her guidance. She also delivered a lecture on the above topic during first technical session. The following steps were involved in the identification of Soil nematodes-

Collection of samples from Soil: The goal of a nematode sampling would be to capture information about the presence of nematode species occurring in one or more landscapes, ecosystems. Soil samples were collected to a depth of 20 cm or more by students of Batch-I and Batch-II. Students selected samples from five directions i.e. north, south, east, west and central regions for collecting of samples. After collecting samples, all soil samples were stored in polythene at room temperature (RT) for further study.

Sieving & Decantation: 400-500 gm of soil samples were placed in bucket-1 and mixed in 5L water & stirred thoroughly with a rod.



Coarse sieve (2 mm) and 300 mesh sieve (Pore size 53 μm)

After that, more water was added to make the volume up to 10 L, and kept undisturbed for 20-30 seconds. Further, the suspension was poured through a 2 mm sieve in a bucket-2. Next, all large pebbles and particles remained on the sieve and were discarded. Then, more water was added in bucket-2, suspension was left undisturbed for 2-3 seconds and poured through a fine 300 mesh sieve (53 μm pore size). Now, nematodes remain on the sieve along with fine sand and mud particles and this was collected in a beaker by adding little water.



Dr Anjum Rizvi performing an identification procedure of nematodes

Fixation: Nematodes have been fixed in 10% formalin, transferred in Glycerine-Alcohol (5 parts Glycerine & 95 parts of ethanol) to desiccator for dehydration.



Dr Anjum Rizvi showing isolated nematodes from the soil samples under the microscope

Preparation of permanent slide: Petri dish were filled with paraffin granules, melt them at about 60°C and allow the paraffin to set into a solid layer on slides. Permanent wax slides were prepared in dehydrated glycerol and studied under a microscope.

The laboratory work was assisted by Mr. Debbrat Dash, Research Scholar.

Experiment-2: Dr. Guru Pada Mandal, Scientist- 'E', ZSI performed and demonstrated to students on Extraction and Characterization Techniques on soil Apterygotes. Dr. Mandal delivered a lecture on the above topic in technical session. The following steps were involved in the extraction and Characterization of soil Apterygotes:

Sample collection: Students collected samples by using an aspirator apparatus with a suckling technique under the guidance of Dr. Mandal.



A view of filed study: Dr Mandal collected the Apterygotes by using an aspirator



Preservation: For the preservation of insects, commonly two methods are used:

1. Dry preservation
2. Wet preservation

However, Dr Mandal used the wet preservation method for the characterization of apterygotes.

Wet preservation: Collected specimens were directly preserved in 70% alcohol for further identification procedure. During the process of sorting, specimens were preserved in 70% alcohol in a glass petridish. Then, specimens were placed on slides and a drop of Hoyer's medium, used as a mounting medium for identification. Next, a cover slip was gently placed on the specimen along with one or two drops of glycerine.

Apterygota (insects) identification key: Dr. Mandal described that Apterygota is divided into two divisions: Entognatha & Ectognatha. Protura, Diplura and Collembola comes under Entognatha. Archaeognatha and Zygentoma comes under Ectognatha. He also defined key points for the identification of insects, especially apterygotes, which are as follows-

→ Thread-like long antennae are many segmented, compound eyes present or absent, abdomen 11 segmented ending in 3 long "bristles", body covered with silvery scales.....Zygentoma (Silverfish).

→ 3 long slender cerci present with longer epiproct, a hump present on the body especially on thorax.....Archaeognatha (Jumping Bristle tails)

→ Body elongated, abdomen 11 segmented, antennae & cerci present, compound eyes & ocelli absentDiplura (two-pronged Bristle tail)

→ Body elongated, abdomen 11 segmented, antennae & cerci absent, no compound eyes, well developed "telson" present.....Protura (Coneheads)

→ Mouthparts entognathous, principally adapted for biting, Antennae usually 4 segmented, compound eyes present or absent, abdomen six segmented.....Collembola

A view of field study: Dr Mandal collected the Apterygotes by using an aspirator





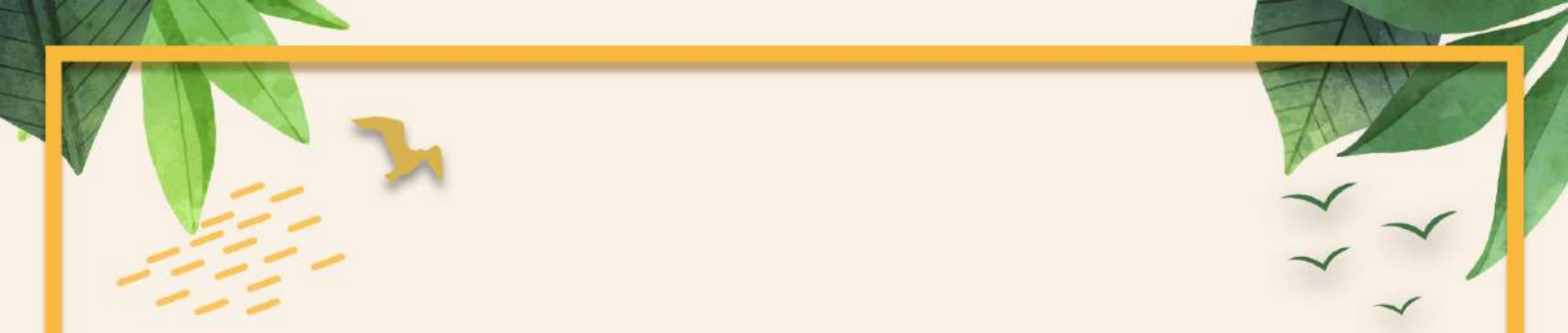
Dr. Mandal demonstrated the slide preparation to the student participants

Dr. Mandal also showed the procedure of matching the characters with keys and found the lot of collection comprised of collembola order. The laboratory work was conducted by Ms. Sneha Bebyan, Research Scholar. Further, field work was assisted by Research Scholars Ms. Surbhi Chourasiya and Ms. Roshni Rajpoot.

6th March, 2024 Wednesday: Technical Session III

Technical Lecture on Extraction and Characterization techniques on Aquatic Biota was chaired by Prof. Subodh Kumar Jain, rapporteur was Dr. Kiran Singh and conducted by Dr. Kalpana Baghel.

Prof J.P. Shukla, Indira Gandhi National Tribal University, Amarkantak, Madhya Pradesh was the resource person. He delivered an informative lecture based on the Aquatic Biota specially fishes.



He talked and discussed about the "Morphological characters of Fishes of different groups". Furthermore, he added the very informative knowledge on "Various Diseases in Fishes" including Bacterial, viral, and protozoan diseases. He discussed regarding symptoms of the infected fishes. The infectious diseases normally attack the fishes through the tissues and organs (dermis, gills, intestine and excretory organs). He mentioned a few examples of fish diseases including dermatitis, anemia, liver cirrhosis, hemorrhage of testes, gill damages etc. He discussed some fish diseases e.g. cotton mouth caused by *Enterobacterium*, Gill rot by *Mycobacterium*, Ulceration by *Aeromonas salmonicida* observed in carp fishes, and protozoan disease e.g. whirling disease. He also focused on the parasitic diseases caused by trematodes or flukes. Furthermore, he also discussed the "Treatment of infectious disease in fishes". He suggested that we can use bleaching powder and Sodium Chloride in pond and stagnant water to protect the fishes and other aquatic life.

At the end, during open discussion, Prof. J.P. Shukla answered a number of questions raised by faculty members and participants and made the session interactive and interesting.



6th March, 2024 Wednesday: Technical Session IV

Technical Lecture on "Extraction and Characterization techniques on Soil Earthworms" was delivered by Dr. Shakoor Ahmed, ZSI, Kolkata. Dr. Malabika Sikdar, Associate Professor chaired the session and Ms. Pooja Tiwari was the rapporteur, the session was conducted by Dr. Nalini Tiwari, Research Associate.

Dr. Shakoor Ahmad highlighted the importance of earthworms in the soil ecosystems and plant growth. Before moving to his lecture, he stated that every organism is working on this planet whether we know about them or not. He introduced earthworms, classification, its ecological categories and highlighted their role. He mentioned about the diversity of earthworms and informed that the most diverse family in India is "Megascolecidae". Further he focussed about the collection methods of earthworms and discussed about few methods which are digging, hand-sorting and quadrant method. He suggested that for the purpose for population study, quadrant method is used. He also discussed about preservation, labelling and identification of earthworms. He focused on 3 families Lumbricidae, Almidiae and Megascolecidae and their identifying characters. Over all, the lecture was all about the collection, preservation and identification of soil earthworms.

At the end of lecture there were questions raised by participants and answers given by Dr. Ahmad made the session interactive, informative and satisfying the participants.



Glimpse of Dr. Shakoor Ahmad, ZSI Kolkata delivering the lecture

Laboratory Demonstration

Experiment- 3:

Dr. Shakoor Ahmed (ZSI) described the **Extraction and Characterization Techniques for Soil Earthworms**. He demonstrated the dissection of the earthworm, and delivered lecture on earthworm physiology and anatomy. He defined the common characteristics of earthworms as follows-

Phylum Annelida is characterized by the presence of ring-like segments throughout the body. The segments are marked externally by intersegmental grooves and internally by transverse septa extending from the body wall to the digestive tract. Except Leeches, all other groups possess hair like structure called setae/chaetae. They are found in terrestrial and aquatic ecosystems and some are adapted to parasitism.



Dr. Shakoor Ahmad
dissecting the earthworm



Dr. Shakoor Ahmad showing the
anatomy of earthworm under the
binocular microscope



Student participants viewing the anatomy of earthworm



Valedictory Session

The valedictory session was conducted on 7th March, 2024 at 5.30 PM. Prof. U.S Gupta, Former Head, Dept. of Zoology was the chief guest. All the experts shared their views and assures participants that they will always be available to solve their queries. Further, Prof. Subodh Kumar Jain, presented deliberation of two days' workshop:

- On March 6, 2024, the inaugural session started at 11:00 a.m.
 - Initially, everyone on the dais Prof. Neelima Gupta, Hon'ble Vice Chancellor, Prof. D. P. Gupta, Dr. Anjum Rizvi (Scientist ZSI), Prof. Versha Sharma (Dean, SBS), and Prof. Shweta Yadav (HoD, Zoology; Convener ZSI MoU) were welcomed by the faculty of the Department of Zoology.
 - Dr. Gurupada Mandal and Prof. J. P. Shukla were also welcomed.
 - Senior Professors of the department (Retd.) Prof. Smita Banerjee and Prof. U.S. Gupta were also welcomed.
 - Dean, School of Biological Sciences Prof. Versha Sharma, delivered welcome address.
 - Prof. Shweta Yadav, Head, Zoology briefed about the workshop and highlighted the criteria for the selection of the organism Apterygote and Nematodes, Earthworms and Fish parasites, and also submitted to the house that the workshop is intended to train our M.Sc. students by and large. While a few PhD students were also registered, those are working vertically on the taxonomy and ecological sciences of targeted organisms.
 - Prof. Thomas (DoRD) briefed about the various MOUs signed by the university and informed that 67 MOUs were signed by the university in the last two years.
 - Dr. Anjum N. Rizvi opened up the possibilities of various joint ventures with ZSI and updated students about the opportunities available at ZSI to carve their career in taxonomy and related subjects. She advised student participants to come to ZSI, Kolkata for summer training and dissertation work, and learn about different groups of organisms.
 - Chief Guest Prof. D.P. Gupta, was overwhelmed with the development in the Department of Zoology.
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- Hon'ble Vice Chancellor Prof. Neelima Gupta said for the Zoology Department, it is the best collaboration to upgrade our students. It is now at the doorstep of the Dept. of Zoology to explore new species in Bundelkhand region and adopt this research field.
 - A vote of thanks was proposed by Dr. Payal Mahobia.
 - A photo session was held with guests on the Dias, participants, faculty and non-teaching staff.
 - In the first technical session, Dr. Anjum N. Rizvi explained the separation techniques and showed the prepared slides of different types of nematodes. Dr. Gurupada Mandal explained various techniques of separation and characterization of apterygotes.
 - Later, hands-on training was provided for the respective groups of organisms.
 - On second day (March 7, 2024), workshop started with fieldwork from 9.00 am in the Botanical garden of the university. Dr. Gurupada Mandal demonstrated practical for the extraction of apterygotes.
 - Thereafter, Prof. J. P. Shukla taught about various parasites of fish. He also presented two books entitled "Regulatory Mechanisms in Vertebrates" and "Fundamentals of Toxicology" to the Department of Zoology.
 - Later, the experiment setup was prepared for the extraction techniques of nematodes and apterygotes was taken up by Dr. Anjum N. Rizvi and Dr. Gurupada Mandal.
 - Post-lunch, Dr. Shakoor Ahmad showed phenotypic plasticity in earthworms.

Recommendations

The house unanimously agreed upon the following recommendations.

1. The ZSI, Kolkata and DHSGU, Sagar came to the conclusion that they would accept 10 students for M.Sc. dissertations this year. In the middle of April 2024, students of M.Sc. IV Semester will be sent for their dissertation work to ZSI, Kolkata.
 2. After the completion of M.Sc. II Semester, 15 students will be sent to ZSI for summer or winter training, or according to the time available with students during the break of the semester.
 3. Further, it was recommended to initiate one more specialisation on "Parasitology" for M.Sc. III semester students with cooperation of the ZSI Kolkata.
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Dr. Rajkumar Koiri, conducted the valedictory session and experts sharing their views



Prof. Subodh Kumar Jain presenting deliberations of two days workshop



Glimpse of students interacting with experts during the technical session

Participants feedback was presented by Ms. Akansha Vishwakarma M.Sc. III semester and Mr. Rajan Yadav M.Sc. I semester.



Participant presenting feedback

Students presented cultural activities. Ms. Alisha Nanda (M.Sc. III Semester), Ms. Aditi Saraf (M.Sc. I Semester) performed dance. Mr. Naman Chappariya (M.Sc. I Semester), Mr. Suman Mishra (M.Sc. III Semester), and Mr. Mohit Rathore sung the song. Lastly, Dr. Malabika Sikdar, Associate Professor, Department of Zoology, DHSGU sung a melodious song.



Further, participants feedback was presented by Ms. Akansha Vishwakarma M.Sc. III semester and Mr. Rajan Yadav M.Sc. I semester.



Glimpse of dance and song performance presented by participants and faculty member of the department of Zoology

Prof. U. S. Gupta, Chief Guest of valedictory session addressed the gathering. Later Class representative of M.Sc. III semester Mr. Suman Mishra and representative of class representative M.Sc. I Ms. Mrinal Nagwanshi proposed the vote of thanks on behalf of participants. Dr. Rajkumar Koiri conducted the valedictory session.



Prof. U. S. Gupta, Chief Guest of valedictory session addressing the gathering



**Class representative M.Sc. III semester and M.Sc. I semester
presenting vote of thanks**



**A group photograph of dignitaries and participants present in
the valedictory ceremony**



The dignitaries and research scholars present in the Valedictory ceremony

Media Coverage

विश्वविद्यालय और जूलॉजिकल सर्वे ऑफ इंडिया के संयुक्त तत्वावधान में दो दिवसीय कार्यशाला आयोजित

प्राणी अध्ययन में ज्ञान का भण्डार है जेडएसआई: प्रो. नीलिमा गुप्ता

विजय मात, खुरो, सागर

डॉ. हरीशंकर गौर विश्वविद्यालय, सागर के जूलॉजी विभाग में बुधवार को जेडएसआई के संयुक्त तत्वावधान में दो दिवसीय कार्यशाला का आयोजन किया गया। कुलगुरु प्रो. नीलिमा गुप्ता की अध्यक्षता में यह कार्यशाला हुई जिसमें जेडएसआई से डॉ. अंजुम रिजवी मुख्य अतिथि थीं। कार्यशाला के विभिन्न अतिथि पूर्व विभागाध्यक्ष प्रो. डी.पी. गुप्ता रहे।

मिस्ट्री एवं जालीय जीवों को अलग करने एवं लक्षण वर्णन तकनीकी विषय पर दो दिवसीय कार्यशाला का आयोजन किया गया। प्रो. वर्षा शर्मा ने कार्यशाला की प्रारंभिक जानकारी दी। कार्यशाला को ऑर्डिनेटर प्रो. धेता यादव ने कहा कि कार्यशाला एंटरप्राइज नेमाटोड केचुप और मछलियाँ मुख्य रूप से एंटीगोटस नेमाटोड्स केचुप और मछलियों पर केंद्रित है। उन्होंने कहा कि कार्यशाला में लगभग 65 विद्यार्थियों ने पंजीयन किया। प्रशिक्षण में विद्यार्थियों को परंपरागत पहचान की तकनीक की जानकारी दी जायेगी। अनुसंधान एवं विकास के निर्देशक प्रो. एच. थामस ने विश्वविद्यालय विभिन्न कार्यक्रम की



जानकारी दी। कार्यशाला की अध्यक्षता जेडएसआई डॉ. अंजुम रिजवी ने कहा जेडएसआई विभिन्न राज्यों के जीवों का अध्ययन एवं क्षेत्रीय जीव संरक्षण पर कार्य कर रही है। इसके साथ ही हम भारत में परिस्थिति की अध्ययन एवं पर्यावरण प्रभाव का आकलन पर भी कार्य कर रहे हैं। इस कार्यशाला में परंपरागत पहचान की तकनीक पर चर्चा करेंगे।

कुलगुरु प्रो. नीलिमा गुप्ता ने कहा कि इस कार्यशाला के माध्यम से जेडएसआई और विश्वविद्यालय

मिलाकर कार्य कर रहे हैं जिससे विद्यार्थियों को अधिक से अधिक नई तकनीक की जानकारी दी जा सके। उन्होंने कहा कि विश्वविद्यालय अभी तक 69 एम.ओयू साईन कर चुका है। अभी हाल ही में हिमाचल विश्वविद्यालय के साथ एम.ओयू साईन किया गया है। जिससे विभिन्न क्षेत्र के विद्यार्थियों को अन्य क्षेत्र में रिसर्च में मदद मिलेगी। जूलॉजिकल सर्वे ऑफ इंडिया (जेडएसआई) पर्यावरण और वन मंत्रालय का एक अधीनस्थ संगठन है। ये प्राणियों के बारे में ज्ञान

का भण्डार है। जेडएसआई के 16 केंद्र हैं। उन्होंने कहा कि शीघ्र ही विश्वविद्यालय को और जेडएसआई के साथ एम.ओयू साईन किया जायेगा। जिससे विश्वविद्यालय के विद्यार्थियों को इसका लाभ मिल सके। कार्यशाला के विभिन्न अतिथि पूर्व विभागाध्यक्ष प्रो. डी.पी. गुप्ता ने कहा कि जूलॉजी विभाग के लिये सौभाग्य है कि वर्तमान में माननीय कुलपति प्रो. नीलिमा गुप्ता भी जूलॉजी विभाग से हैं। जिससे विभाग को भविष्य इसका लाभ मिलेगा। कार्यशाला में दोपहर तकनीक मत्स्य वैज्ञानिक प्रो. जर्नद प्रसाद शुक्ला इंदिरा गांधी दूरिष्वल विश्वविद्यालय अमरकंटक भी उपस्थित रहे जो मत्स्य परजीवी के अध्ययन की तकनीकी विद्यार्थियों को सिखायेगे डॉ. गुरुपदा मंडल मृदा के सूक्ष्म कीटों के बारे में गहन अध्ययन करण सत्र पूर्व विभागाध्यक्ष प्रो. स्मिता बेंनजी ने लिया। सभी आपा आर्। पायल मछलियां ने किया। कार्यशाला में पूर्व विभागाध्यक्ष प्रो. सुजोष जैन, प्रो. ए.एस. गुप्ता, डॉ. जी.पी। शुक्ला, रीतिका, प्रो. एम. एल. खान, डॉ. राजकुमार कोहरी, सहित अन्य फैकल्टी उपस्थित रहे।

On Electronic/Social Media



Doctor Harisingh Gour Vishwavidyalaya, Sagar

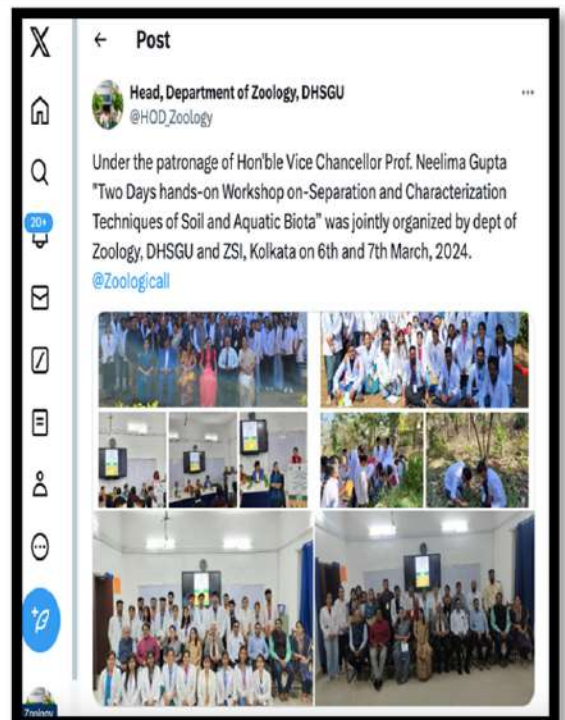
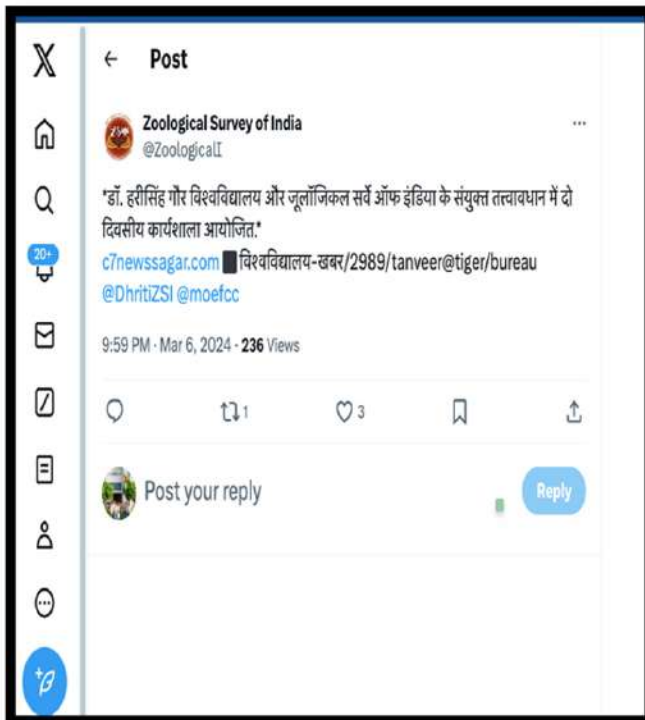
March 11 at 3:00 PM ·

प्राणी अध्ययन में ज्ञान का भण्डार है जेडएसआई - कुलपति प्रो नीलिमा गुप्ता विश्वविद्यालय और जूलॉजिकल सर्वे ऑफ इंडिया के संयुक्त तत्वाधान में दो दिवसीय कार्यशाला आयोजित

डॉ हरीसिंह गौर विश्वविद्यालय, सागर के जूलॉजी विभाग में बुधवार को जेडएसआई के संयुक्त तत्वाधान में दो दिवसीय कार्यशाला का आयोजन किया गया। कुलगुरु प्रो. नीलिमा गुप्ता की अध्यक्षता में यह कार्यशाला हुई जिसमें जेडएसआई से डॉ अंजुम रिजवी मुख्य अतिथि थीं। कार्यशाला के विभिन्न अतिथि पूर्व विभागाध्यक्ष प्रो डी.पी. गुप्ता रहे।

मिट्टी एवं जलीय जीवों को अलग करने एवं लक्षण वर्णन तकनीक विषय पर दो दिवसीय कार्यशाला का आयोजन किया गया। प्रो वर्णा शर्मा ने कार्यशाला की प्रारंभिक जानकारी दी। कार्यशाला को-आर्डीनेटर प्रो रवेला यादव ने कहा कि कार्यशाला एप्टीगोट्स नेमाटोड केसुए और मछलियाँ मुख्य रूप से एप्टीगोट्स नेमाटोडस केसुए और मछलियों पर केंद्रित है। उन्होंने कहा कि कार्यशाला में लगभग 65 विद्यार्थियों ने पंजीयन किया। प्रशिक्षण में विद्यार्थियों को परंपरागत पहचान की तकनीक की जानकारी दी जायेगी। अनुसंधान एवं विकास के निर्देशक प्रो. एच धामस ने विश्वविद्यालय विभिन्न कार्यक्रम की जानकारी दी। कार्यशाला की अध्यक्षता जेडएसआई डॉ. अंजुम रिजवी ने कहा जेडएसआई विभिन्न राज्यों के जीवों का अध्ययन एवं क्षेत्रीय जीव संरक्षण पर कार्य कर रही है। इसके साथ ही हम भारत में परिस्थिति की अध्ययन एवं पर्यावरण प्रभाव का आकलन पर भी कार्य कर रहे हैं। इस कार्यशाला में परंपरागत पहचान की तकनीक पर चर्चा करेंगे।

कुलगुरु प्रो नीलिमा गुप्ता ने कहा कि इस कार्यशाला के माध्यम से जेडएसआई और विश्वविद्यालय मिलाकर कार्य कर रहे हैं जिससे विद्यार्थियों को अधिक से अधिक नई तकनीक की जानकारी दी जा सके। उन्होंने कहा कि विश्वविद्यालय अभी तक 69 एमओयू साईन कर चुका है। अभी हाल ही में हिमाचल विश्वविद्यालय के साथ एमओयू साईन किया गया है, जिससे विभिन्न क्षेत्र के विद्यार्थियों को अन्य क्षेत्र में रिसर्च में मदद मिलेगी। जूलॉजिकल सर्वे ऑफ इंडिया (जेडएसआई) पर्यावरण और वन मंत्रालय का एक अधीनस्थ संगठन है। ये प्राणियों के बारे में ज्ञान का भण्डार है। जेडएसआई के 16 केंद्र हैं। उन्होंने कहा कि शीघ्र ही विश्वविद्यालय की ओर जेडएसआई के साथ एमओयू साईन किया जायेगा। जिससे विश्वविद्यालय के विद्यार्थियों को इसका लाभ मिल सके। कार्यशाला के विभिन्न अतिथि पूर्व विभागाध्यक्ष प्रो डीपी गुप्ता ने कहा कि जूलॉजी विभाग के लिये सौभाग्य है कि वर्तमान में माननीय कुलपति प्रो नीलिमा गुप्ता भी जूलॉजी विभाग से ही हैं, जिससे विभाग को भविष्य इसका लाभ मिलेगा। कार्यशाला में दोपहर तकनीक मत्स्य वैज्ञानिक प्रो. जर्नद प्रसाद शुक्ला इंदिरा गांधी टॉयबल विश्वविद्यालय अमरकंटक भी उपस्थित रहे जो मत्स्य परजीवी के अध्ययन की तकनीक विद्यार्थियों को सिखायेंगे डॉ. गुलपदा मडल मृदा के सूक्ष्म कीटों के बारे में गहन अध्ययन कराया सत्र पूर्व विभागाध्यक्ष प्रो. स्मिता बेनर्जी ने लिया। सभी आभार डॉ. पायल महोबिया ने किया। कार्यशाला में पूर्व विभागाध्यक्ष प्रो सतीश जैन, प्रो य एस राय, डॉ जी पी शक्ला, गीतिका प्रो एम



Tweets by Zoological Survey of India and Dept of Zoology, Dr Harisingh Gour Vishwavidyalaya, Sagar



Two days Hands-on Training on

Separation and Characterization Techniques of Soil and Aquatic Biota

(Primarily focused on Apterygotes, Nematodes, Earthworms, and Fishes)

6th and 7th March, 2024

Jointly Organized by
Dr Harisingh Gour Vishwavidyalaya
(A Central University)
Sagar, M.P.

&
Zoological Survey of India, Kolkata, W.B.



Dr. Dhriti Banerjee

Director, ZSI
Ministry of Environment, Forests
& Climate Change, GoI



Coordinator, ZSI

Dr. Anjum N. Rizvi

Senior Scientist
Zoological Survey of India,
Kolkata, W.B.



Coordinator, DHSGVV

Prof. Shweta Yadav

Head, Department of Zoology
Dr. Harisingh Gour Vishwavidyalaya,
Sagar, M.P.



Chief Patron

Prof. Neelima Gupta

Hon'ble Vice Chancellor
Dr. Harisingh Gour Vishwavidyalaya,
Sagar, M.P.

Registration Fee: M. Sc.- 600/-; Ph. D.- 800/-; Faculty member- 1000/-

Registration Link: <https://forms.gle/o1wSHrw8CcbsuXU67>

Last Date of Registration

**28th February,
2024**

Venue: Department of Zoology,

Dr. Harisingh Gour Vishwavidyalaya, Sagar

Scan and Pay



Registration Brochure

Programme Schedule



Two days Hands-on Workshop on “Separation and Characterization Techniques of Soil and Aquatic Biota”

(Primarily focused on Apterygotes, Nematodes, Earthworms, and Fishes)

Jointly Organized by

Zoological Survey of India
Kolkata
(West Bengal)

Dr. Harisingh Gour Vishwavidyalaya
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Sagar (M.P.)

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Sagar (M.P.)



Patron

Prof. Neelima Gupta
Hon'ble Vice-Chancellor
Dr. Harisingh Gour Vishwavidyalaya
Sagar (M.P.)

Venue

Dept of Zoology, Dr. Harisingh Gour Vishwavidyalaya, Sagar.

www.dhsgsu.edu.in



Two days Hands-on Workshop on
“Separation and Characterization
Techniques of
Soil and Aquatic Biota”



6 March 2024

Inaugural Session

Venue: Seminar Hall, Dept of Zoology

10.00 - 11.00 AM

Welcome Address: Prof. Versha Sharma, Dean, School of Biological Sciences,
Dr Harisingh Gour Vishwavidyalaya, Sagar

About the Workshop: Prof. Shweta Yadav, Head, Dept of Zoology And
Coordinator ZSI-MOU

Collaborations of the University: Prof. H. Thomas, DORD

Technical Address: Dr Anjum Rizvi, Scientist E, Coordinator ZSI-MOU

Address by Chief Guest: Prof. D.P. Gupta, Former Professor, Dept of Zoology,
Dr Harisingh Gour Vishwavidyalaya, Sagar

Inaugural Address: Prof. Neelima Gupta, Hon'ble Vice Chancellor,
Dr Harisingh Gour Vishwavidyalaya, Sagar

Vote of Thanks: Dr Payal Mahobiya, Dept of Zoology,
Dr Harisingh Gour Vishwavidyalaya, Sagar

National Anthem

Tea

Photo Session

Venue

Dept of Zoology, Dr. Harisingh Gour Vishwavidyalaya, Sagar.

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Two days Hands-on Workshop on “Separation and Characterization Techniques of Soil and Aquatic Biota”



Technical Session	
Technical Lecture on Extraction and Characterization techniques on Soil Nematodes: Dr Anjum Rizvi Chairperson: Prof S. Banerjee, Former Professor, Dept of Zoology, Dr Harisingh Gour Vishwavidyalaya, Sagar Rapporteur: Dr Nalini Tiwari, Research Associate	11.00-12.30 PM
Tea	12.30-12.40 AM
Technical Lecture on Extraction and Characterization techniques on Soil Apterygotes: Dr G. Mandal Chairperson: Prof Versha Sharma, Dr Harisingh Gour Vishwavidyalaya, Sagar Rapporteur: Mr Praddum Namdev, Research Scholar	12.40-2.00 PM
Lunch	2.00-2.30 PM
Hands on Training in Two laboratories Batch I on Nematodes in M.Sc. I Sem Laboratory by Dr Anjum Rizvi Batch II on Soil Apterygotes in M. Sc. III Sem. Entomology Laboratory by Dr G. Mandal	2.30-3.30 PM
Tea	3.30-3.40 PM
Hands on Training in Two laboratories Batch I on Soil Apterygotes in M. Sc. III Sem. Entomology Laboratory by Dr G. Mandal Batch II on Nematodes in M.Sc. I Sem Laboratory by Dr Anjum Rizvi	3.40- 5.40 PM
Students Practical exercise: Preparation of Slides	5.40- 6.40 PM

Venue

Dept of Zoology, Dr. Harisingh Gour Vishwavidyalaya, Sagar.

www.dhsgsu.edu.in



Two days Hands-on Workshop on “Separation and Characterization Techniques of Soil and Aquatic Biota”



7 March 2024	
Examination and Evaluation of Slides prepared by Students by Dr Anjum Rizvi	9.00-10.00 AM
Examination and Evaluation of Slides prepared by Students by Dr G. Mandal	
Technical Lecture on Extraction and Characterization techniques on Aquatic Biota (in particular fish and their Parasites): Prof J.P. Shukla Chairperson: Prof Subodh Jain, Former Professor, Dr Harisingh Gour Vishwavidyalaya, Sagar Rapporteur: Ms Kiran Singh, Research Scholar	10.30-12.00 AM
Tea	12.00-12.10 PM
Technical Lecture on Extraction and Characterization techniques on Soil Earthworms: Dr Shakoor Ahmad Chairperson: Dr Malvika Sikdar, Dr Harisingh Gour Vishwavidyalaya, Sagar Rapporteur: Ms Pooja Tiwari, Research Scholar	12.10-1.40 PM
Lunch	1.40-2.30 PM
Hands on Training in Two laboratories Soil Earthworms in M. Sc. I Sem. Laboratory by Dr Shakoor Ahmad Aquatic Biota in M. Sc. III Sem. Laboratory by Prof J.P. Shukla	2.30- 5.00 PM
Discussion & Evaluation of Students Skill developed on Aquatic Biota and Soil Earthworms by Subject Expert(s)	5.30- 6.00 PM
Feedback by Students	6.00- 6.15 PM
Vote of Thanks by Class Representatives M.Sc. Students (I and III Semester)	
Distribution of Certificates with Marks scored during the Workshop	

Venue

Dept of Zoology, Dr. Harisingh Gour Vishwavidyalaya, Sagar.

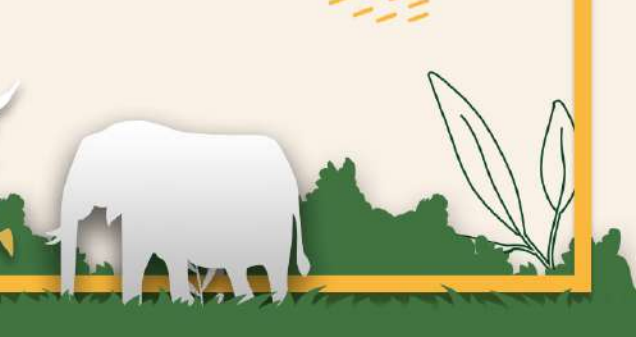
www.dhsgsu.edu.in

List of Participants

Sr .No.	Name of Participants
1.	Aaradhya Tripathi
2.	Abhishek Kumar Patel
3.	Aditi Saraf
4.	Afsan Anjum
5.	Akanksha Vishwakarma
6.	Akansha Singh
7.	Alisha Nanda
8.	Aman Gupta
9.	Ameya R
10.	Anupam Kumar
11.	Archana Rajak
12.	Awani Thakur
13.	Bharat Kumar
14.	Bipasha Priyadarshini
15.	Brajesh Kachhi
16.	Diksha Singh
17.	Divya Kumari
18.	Dr Kiran Singh
19.	Dr Nalini Tiwari
20.	Garima Stephen
21.	Gunjan Palere
22.	Gyana Prakash Barik
23.	Jyoti Singh
24.	Kamlesh Prajapati
25.	Kaushiki Pandey
26.	Keerti Dangi
27.	Khushboo Gupta
28.	Kriti Pandey
29.	Kushi Meena
30.	Likun Kumar Sahu
31.	Madhuri Singh Sahram
32.	Mrinal
33.	Muskan Rajak



34.	Nageshwar Kushwaha
35.	Naman Chhaperiya
36.	Neha Bharti
37.	Palak Kesharwani
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39.	Pooja Tiwari
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