International Symposium on Ciliate Biology (ISCB 2022)

Report

In commemoration of Centenary Celebrations, Acharya Narendra Dev College and Maitreyi College, in collaboration with INSCR (Indian Network for Soil Contamination Research) organized an online **3rd International Symposium on Ciliate Biology 2022 (ISCB 2022)** on November 08, 2022.

Thirteen Speakers of International repute enlightened the gathering about their research work Plenary talk was delivered by Prof Gaytha who is Professor of Environment Policy at Bryant University, Rhode Island, USA. Other Eminent speakers were Prof Cristina Micelli, Prof Alexey, Prof. Fokin and Dr Alan Warren to name a few. The symposium also gave opportunity to UG/PG students and research scholars to present their research work in oral and poster sessions. One of the highlights of the conference was conferring **Lifetime Achievement Award** to Prof. G.R Sapra for his outstanding achievements and contribution to Ciliate Biology.

The themes covered during the Symposium were Biodiversity, Ecology, Evolution, Systematics, Genomics, Epigenetics, DNA Barcoding, Proteomics and Bacterial Symbionts in Ciliates

Registration for the symposium was open to UG/PG students, research scholars, Post-doctoral fellows, and faculty. More than 100 participants registered for the symposium from various National and International academic institutions. Undergraduate students were encouraged to participate in the symposium through subsidized registration costs. Students or emerging scholars accounted for approximately one-quarter of the participants.

The symposium aims to achieve the following –

- To provide a platform for the ciliate interest group to exchange information, present the latest research findings, and establish collaborations
- To enthuse a large number of Indian and foreign undergraduate and postgraduate students to take up ciliated protists as their preferred research area
- To provide networking opportunities for students wishing to take up doctoral or postdoctoral research on ciliates

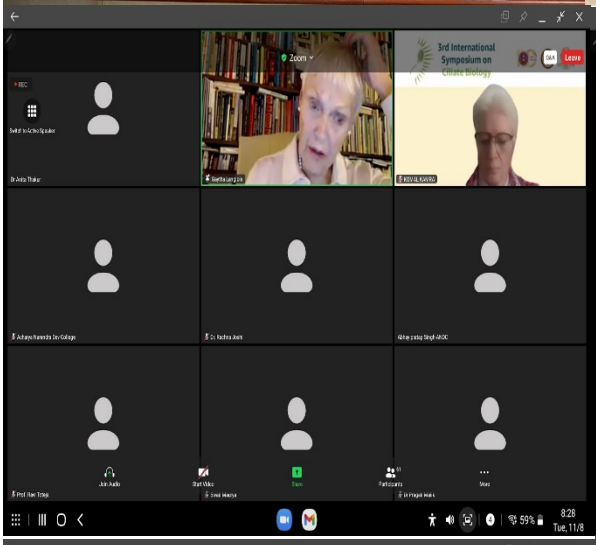
Prof. Ravi Toteja, officiating Principal of the College concluded the 3rd International Symposium on Ciliate Biology by thanking the delegates and the presenters for their participation.Prof. Ravi Toteja also thanked the organizing committee for the successful completion of the Symposium.

Keynote and Invited Speakers:

Name of Speaker	Affiliation	Title of Talk
Prof Cristina Miceli	School of Biosciences and Veterinary Medicine University of Camerino via Gentile III da Varano 62032 Camerino (MC) ITALY	Ciliate as sensors for environmental stresses
Prof Bettina Sonntag	University of Innsbruck Research Department for Limnology, Mondsee, Austria	Identification of Planktonic Freshwater Ciliates and their Key Roles in Aquatic Environments
Prof Alexey Potekhin	Department of Microbiology, Faculty of Biology, St Petersburg	Diversity and Dynamics of Microbiomes associated with Freshwater Ciliates
Prof. Sergey Fokin	Department of Biology, Università, di Pisa, UNIPI	Ciliates and its symbionts from ecological point of view
Prof. Gaytha Langlois	Professor of Environmental Policy, Bryant University, Rhode Island, USA	Ciliates in extreme environments
Prof Zhongtang Yu	Professor, College of Food, Agricultural, and Environmental Sciences OSU Center of Microbiome Science Department of Animal Sciences 110E | 2029 Fyffe Road | Columbus, OH 43210-1095	Genomics of Rumen Ciliates
Prof. Elena Sabaneyeva	Professor, Saint Petersburg State University	Symbiotic associations in ciliates: problems and perspectives
Dr. Alan Warren	NaturalHistory MuseumCromwell Road, London SW7 5B, UK.	Protists are for everyone: A personal overview of knowledge dissemination and promoting public awareness.
Dr Adriana Vallesi	Associate Professor, University of Camerino, Macerata, Marche, Italy	Pheromone and pheromone genes structure, expression and evolution.
Rosaura Mayén Estrada	Universidad Nacional	Symbiotic ciliates of molluscs with emphasis on species from

	Autónoma de México, Mexico	Mexico
Dr Valentina Serra	Project Assistant, H2020-MSCA-RISE "NGTax" project, Pisa University	Next Generation Taxonomy: Ciliophora and their bacterial symbionts as a proof of concept" (Acronym: NGTax)
Post Doctoral Fellows		
Dr Yuanyuan Wang	Laboratory of Protozoology, Institute of Evolution and Marine Biodiversity, Ocean University of China	Semi-conservative transmission of eukaryotic N6-adenine methylation, 6mA
Dr Harpreet Kaur	Postdoctoral Fellow Dacks Lab Division of Infectious Disease, Department of Medicine, University of Alberta	Expansion of SM and Qa-SNARE proteins to regulate vesicle fusion in ciliates
S.Sripoorna	Postdoctoral Fellow Animal Science Building, Ohio State University, Columbus, Ohio, USA	Bioinformatics analysis of heavy metal (Cadmium and Copper) binding proteins and Cysteine-rich proteins in *Tetmemena*sp. SeJ-2015 to affirm their roles in heavy metal tolerance

Photos from the Conference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3rd International Symposium on Climate Biology
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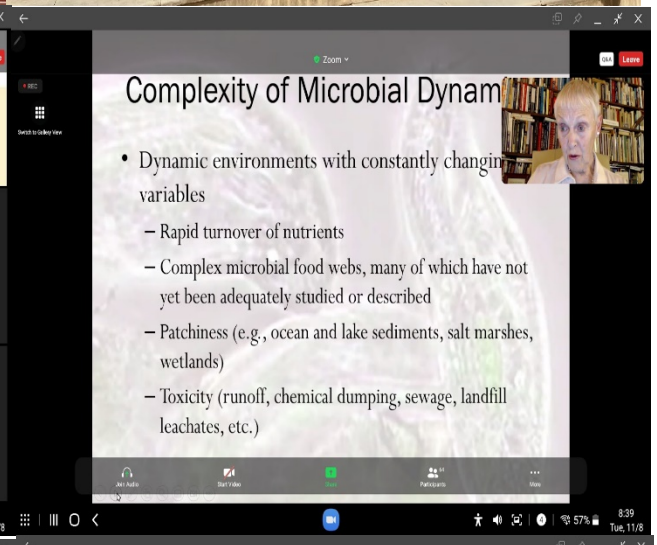
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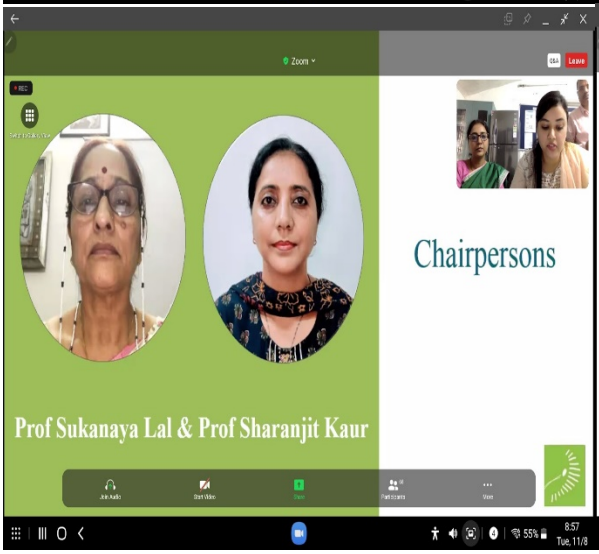
Complexity of Microbial Dynam
• Dynamic environments with constantly changin variables
– Rapid turnover of nutrients
– Complex microbial food webs, many of which have not yet been adequately studied or described
– Patchiness (e.g., ocean and lake sediments, salt marshes, wetlands)
– Toxicity (runoff, chemical dumping, sewage, landfill leachates, etc.)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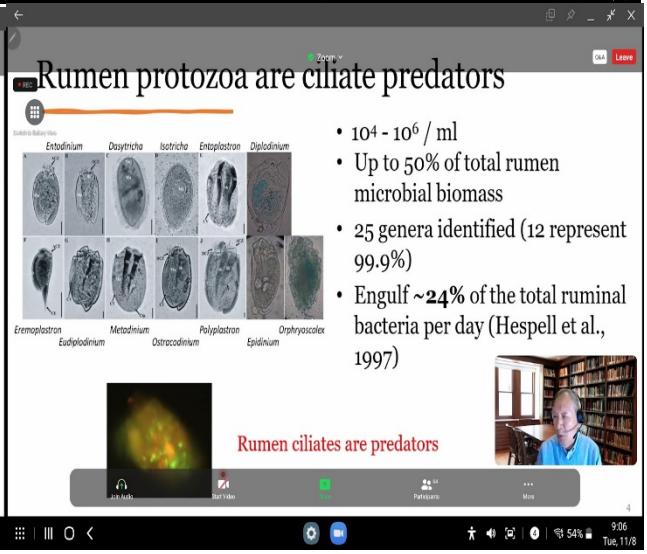
Chairpersons
Prof Sukanaya Lal & Prof Sharanjit Kaur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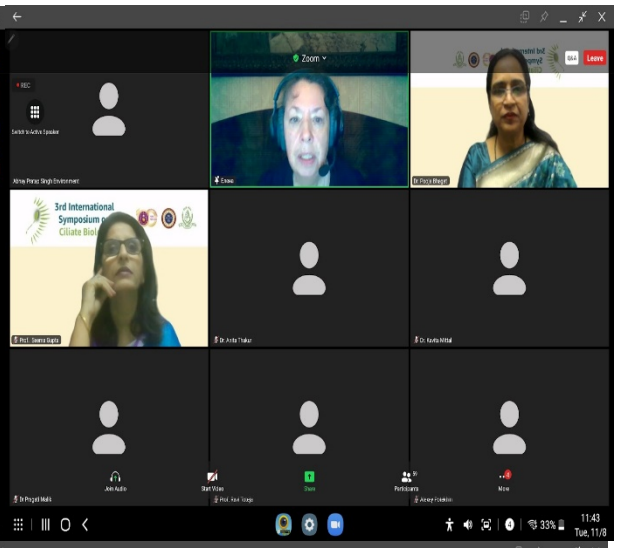
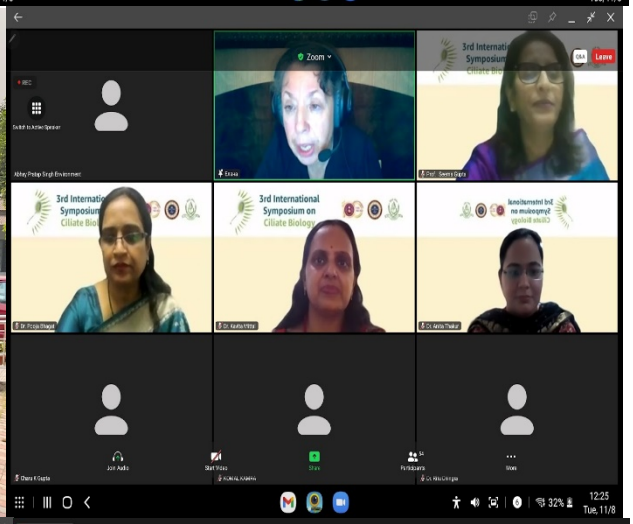
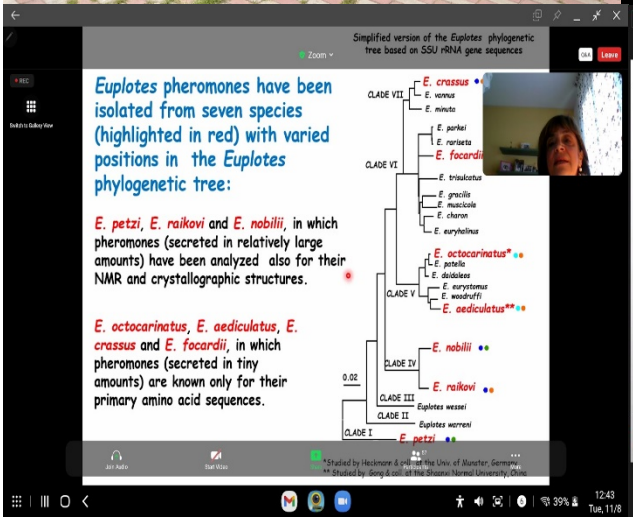
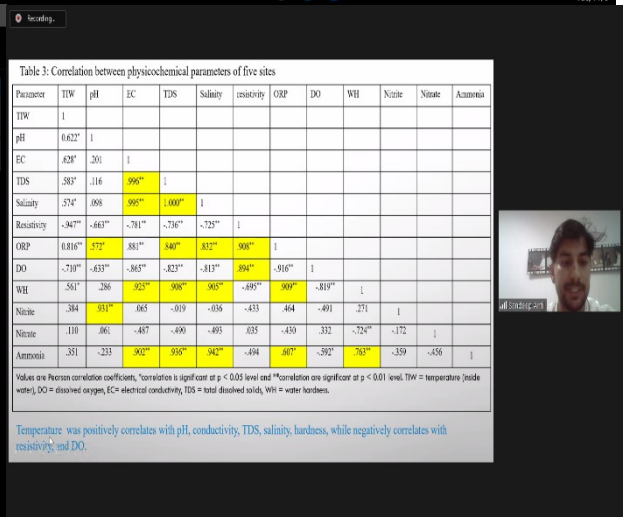
Rumen protozoa are ciliate predators
Entodinium
Dasytricha
Isotricha
Entoplastron
Diplodinium
Eremoplastron
Eudiplodinium
Metadinium
Ostracodinium
Polyplastron
Epidinium
Orphryoscolex
• 10⁴ - 10⁶ / ml
• Up to 50% of total rumen microbial biomass
• 25 genera identified (12 represent 99.9%)
• Engulf ~24% of the total ruminal bacteria per day (Hespell et al., 1997)
Rumen ciliates are predators

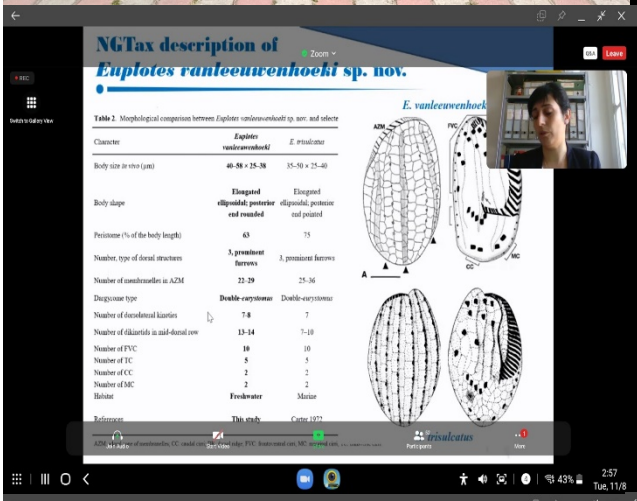


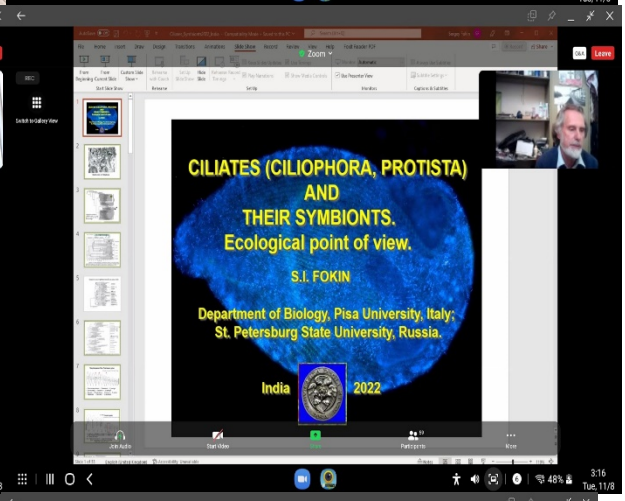


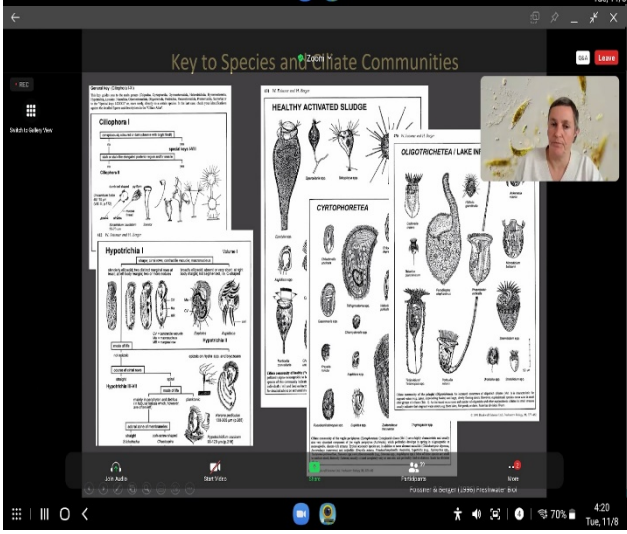


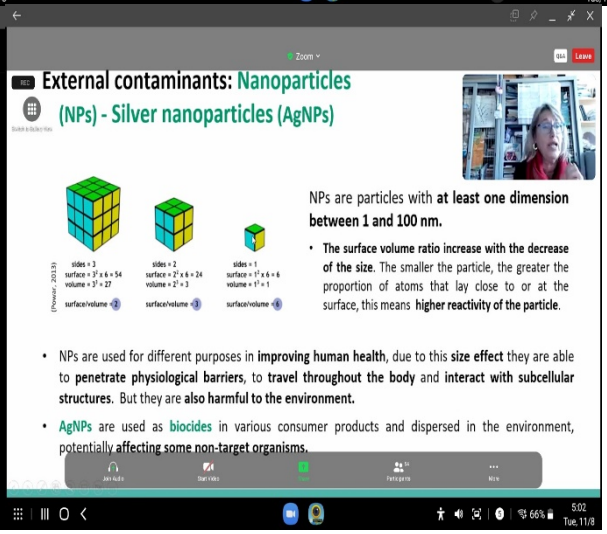


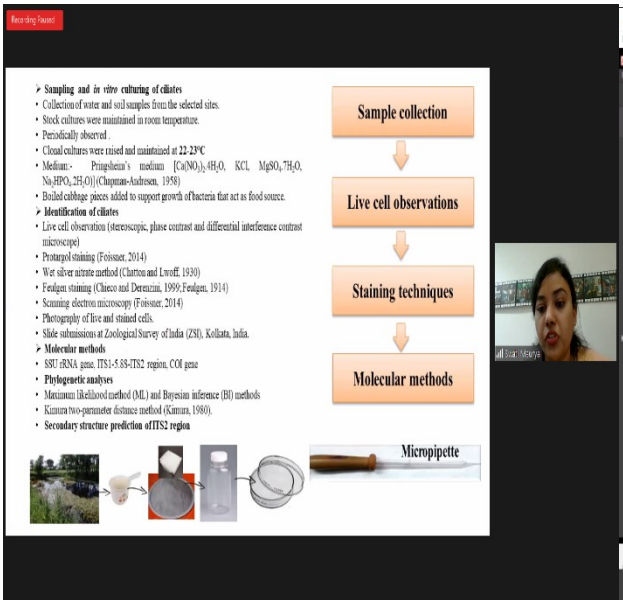
Parameter	TTW	pH	EC	TDS	Salinity	resistivity	ORP	DO	WH	Nitrite	Nitrate	Ammonia
TTW	1											
pH	0.622*	1										
EC	.628*	.201	1									
TDS	.583*	.116	.996**	1								
Salinity	.574*	.098	.995**	1.000**	1							
Resistivity	-.947**	-.663**	-.781**	-.736**	-.725**	1						
ORP	0.816**	.572*	.881**	.840**	.832**	.908**	1					
DO	-.710**	-.633**	-.865**	-.823**	-.813**	.894**	-.916**	1				
WH	.561*	.286	.925**	.908**	.905**	-.695**	.909**	-.819**	1			
Nitrite	.384	.931**	.065	-.019	-.036	-.433	.464	-.491	.271	1		
Nitrate	.110	.061	-.487	-.490	-.493	.035	-.450	.332	-.724**	-.172	1	
Ammonia	.351	-.233	.902**	.936**	.942**	-.494	.607*	-.592*	.763**	-.359	-.456	1

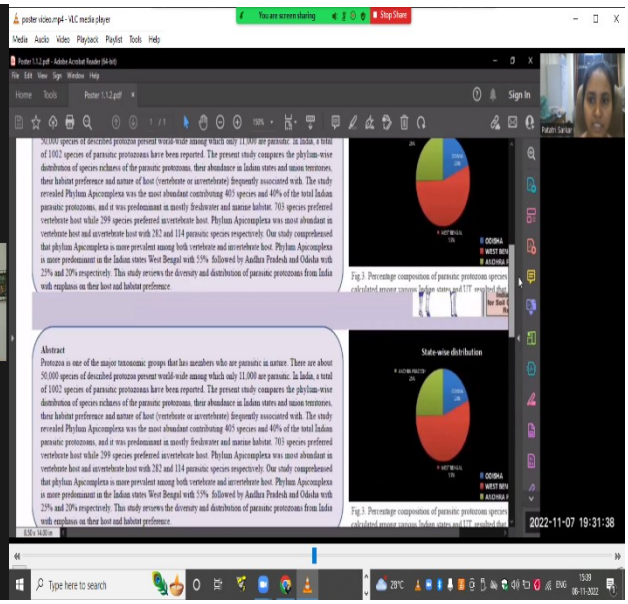

NGTax description of
Euplotes vanleeuwenhoeki sp. nov.
E. vanleeuwenhoeki
Table 2. Morphological comparison between Euplotes vanleeuwenhoeki sp. nov. and selecte
Character
Euplotes vanleeuwenhoeki
E. trisulcatus
Body size in vivo (µm)
40–58 × 25–38
35–50 × 25–40
Body shape
Elongated ellipsoidal; posterior end rounded
Elongated ellipsoidal; posterior end pointed
Peristome (% of the body length)
63
75
Number, type of dorsal structures
3, prominent furrows
3, prominent furrows
Number of membranelles in AZM
22–29
25–36
Diargycome type
Double-eurystomus
Double-eurystomus
Number of frontoventral kineties
7-8
7
Number of ciliakinetids in mid-dorsal row
13–14
7–10
Number of FVC
10
10
Number of TC
5
5
Number of CC
2
2
Number of MC
2
2
Habitat
Freshwater
Marine
References
This study
Carter 1972
AZM
FVC
CC
MC
A
trisulcatus


CILIATES (CILIOPHORA, PROTISTA)
AND
THEIR SYMBIONTS.
Ecological point of view.
S.I. FOKIN
Department of Biology, Pisa University, Italy;
St. Petersburg State University, Russia.
India
2022


Key to Species and Ciliate Communities
Ciliophora I
Hypotrichia I
HEALTHY ACTIVATED SLUDGE
CYRTOPHORETEA
OLIGOTRICHETEA / LAKE IN


External contaminants: Nanoparticles
(NPs) - Silver nanoparticles (AgNPs)
sides = 3
surface = 3² x 6 = 54
volume = 3³ = 27
surface/volume = 2
sides = 2
surface = 2² x 6 = 24
volume = 2³ = 8
surface/volume = 3
sides = 1
surface = 1² x 6 = 6
volume = 1³ = 1
surface/volume = 6
(Piovesan, 2013)
NPs are particles with at least one dimension between 1 and 100 nm.
The surface volume ratio increase with the decrease of the size. The smaller the particle, the greater the proportion of atoms that lay close to or at the surface, this means higher reactivity of the particle.
NPs are used for different purposes in improving human health, due to this size effect they are able to penetrate physiological barriers, to travel throughout the body and interact with subcellular structures. But they are also harmful to the environment.
AgNPs are used as biocides in various consumer products and dispersed in the environment, potentially affecting some non-target organisms.


Recording Paused
➢ Sampling and in vitro culturing of ciliates
• Collection of water and soil samples from the selected sites.
• Stock cultures were maintained in room temperature.
• Periodically observed .
• Clonal cultures were raised and maintained at 22-23°C
• Medium:- Prinsheim's medium [Ca(NO3)2.4H2O, KCl, MgSO4.7H2O, Na2HPO4.2H2O])(Chapman-Andresen, 1958)
• Boiled cabbage pieces added to support growth of bacteria that act as food source.
➢ Identification of ciliates
• Live cell observation (stereoscopic, phase contrast and differential interference contrast microscope)
• Protargol staining (Foissner, 2014)
• Wet silver nitrate method (Chatton and Lwoff, 1930)
• Feulgen staining (Chieco and Derenzini, 1999; Feulgen, 1914)
• Scanning electron microscopy (Foissner, 2014)
• Photography of live and stained cells.
• Slide submissions at Zoological Survey of India (ZSI), Kolkata, India.
➢ Molecular methods
• SSU rRNA gene, ITS1-5.8S-ITS2 region, COI gene
• Phylogenetic analyses
• Maximum likelihood method (ML) and Bayesian inference (BI) methods
• Kimura two-parameter distance method (Kimura, 1980).
• Secondary structure prediction of ITS2 region
Sample collection
Live cell observations
Staining techniques
Molecular methods
Micropipette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Abstract
Protozoa is one of the major taxonomic groups that has members who are parasitic in nature. There are about 50,000 species of described protozoa present world-wide among which only 11,000 are parasitic. In India, a total of 1002 species of parasitic protozoans have been reported. The present study compares the phylum-wise distribution of species richness of the parasitic protozoans, their abundance in Indian states and union territories, their habitat preference and nature of host (vertebrate or invertebrate) frequently associated with. The study revealed Phylum Apicomplexa was the most abundant contributing 403 species and 40% of the total Indian parasitic protozoans, and it was predominant in mostly freshwater and marine habitat. 703 species preferred vertebrate host while 299 species preferred invertebrate host. Phylum Apicomplexa was most abundant in vertebrate host and invertebrate host with 282 and 114 parasitic species respectively. Our study comprehensed that phylum Apicomplexa is more prevalent among both vertebrate and invertebrate host. Phylum Apicomplexa is more predominant in the Indian states West Bengal with 55% followed by Andhra Pradesh and Odisha with 22% and 20% respectively. This study reviews the diversity and distribution of parasitic protozoans from India with emphasis on their host and habitat preference.
State-wise distribution
ODISHA
WEST BEN
ANDHRA P
Fig 3. Percentage composition of parasitic protozoan species
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28°C
15:39
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