

Zoology Departmental Report (2023-2024)

Preliminary information

I Department profile

Dr. Roshan D'Souza - Head of Department

Ms. Sandhya Kadiru

II Courses/Papers taught

SEMESTER I -

DSC Minor Theory Course: SZOO111MN - Diversity of Animal Kingdom

DSC Minor Practical Course: SBSZOO111MNP

Open Elective Courses:

OE101A – Nutrition & Public Health

OE101B – Butterfly Gardening

Indian Knowledge System:

IKS107 – Animal Husbandry in Ancient India

Value Education Courses :

VEC104 – Elements of Ecology

VEC105 – UN Sustainable Development Goals

SEMESTER II-

DSC Minor Theory Course: SZOO122MN - Comparative Physiology

DSC Minor Practical Course: SBSZOO122MNP

Open Elective Courses:

OE201A – Nutrition & Public Health

OE201B – Butterfly Gardening

Value Education Courses :

VEC204 – Elements of Ecology

VEC205 – UN Sustainable Development Goals

VEC207 – Environmental Science

SEMESTER III

Theory Course 1: SBSZOO301- Classification of Chordates & Developmental Biology

Theory Course 2: SBSZOO302 – Cell Biology & Genetics

Theory Course 3: SBSZOO303 –Research Methodology & Applied Zoology - I

Practical Course: SBSZOOP3

SEMESTER IV

Theory Course 1: SBSZOO401 –Life Processes

Theory Course 2: SBSZOO402 –Biochemistry & Histology

Theory Course 3: SBSZOO403 – Applied Zoology - II

Practical Course: SBSZOOP4

III BOS composition

Dr. Roshan D'Souza - Chairperson, Board of Studies

Ms. Sandhya Kadiru -Senior Teacher

Dr. Vaishali Somani -The Vice-Chancellor's nominee

Dr. B. B. Nath -Subject Expert (outside the Parent University)

Dr. Peeyush Pahade -(outside the Parent University)

Dr. Aldon Fernandes - Representative from industry

Ms. Juili Mirgule - Postgraduate alumnus

Dr. Pushpa Sinkar - Other Member of Faculty

IV Dates of BOS meetings

14th October 2023

16th April, 2024

1. Activities Conducted by the department:

ACTIVITY 1

- Title of the activity/event - Interactive Session on World Nature Conservation Day
- Date (from & to) - 28th July 2023
- Number of staff members involved – 2 - Dr. Roshan D'Souza & Dr. Vaishali Pachunde
- Number of students involved - 64
- Guest/Speaker – Dr. Roshan D'Souza
- Geotagged Photographs (please include photographs even if they are not geotagged)





ACTIVITY 2

- Title of the activity/event - Butterfly Gardening (ONLINE WEBINAR)
- Date (from & to) - 30th September 2023
- Number of staff members involved – One – Ms. Sandhya Kaduru
- Number of students involved - 46
- Guest/Speaker – Ms. Priyanka Singh
- Geotagged Photographs (please include photographs even if they are not geotagged)



Butterfly Gardening Part 1



ACTIVITY 3

Science Day Activity - Students of FY and SY Zoology explained the interesting facts about the animal world to school students on Science Day on 28th Feb. 2024.





2. Field trips done by the department, should include:

FIELD TRIP 1

- Name of the place : Sassoon Dock and Fishery Survey of India Head office, Colaba
- Date (from & to) : 9th February, 2024
- Number of staff members involved - Two
- Number of students involved - 23
- Geotagged Photographs (please include photographs even if they are not geotagged)





FIELD TRIP 2

- Name of the place- Ovalekar Wadi Butterfly Garden, Thane
- Date (from & to) – 21st February, 2024
- Number of staff members involved - Two
- Number of students involved - 23
- Geotagged Photographs (please include photographs even if they are not geotagged)





3. Special pedagogical tools used, other than the lecture method

1. Use of multimedia like PPTs, Videos
2. Debates
3. Creation of Padlets
4. Seminar presentation by students
5. Creation of infographics
6. Quizzes, Crosswords
7. Flipped Classroom with eContent delivery
8. Extension of classroom activities
9. Survey based assignments
10. Literature reviews
11. Exhibitions / Poster presentations

4. Any special programs conducted for either /both slow learners and advanced learners.

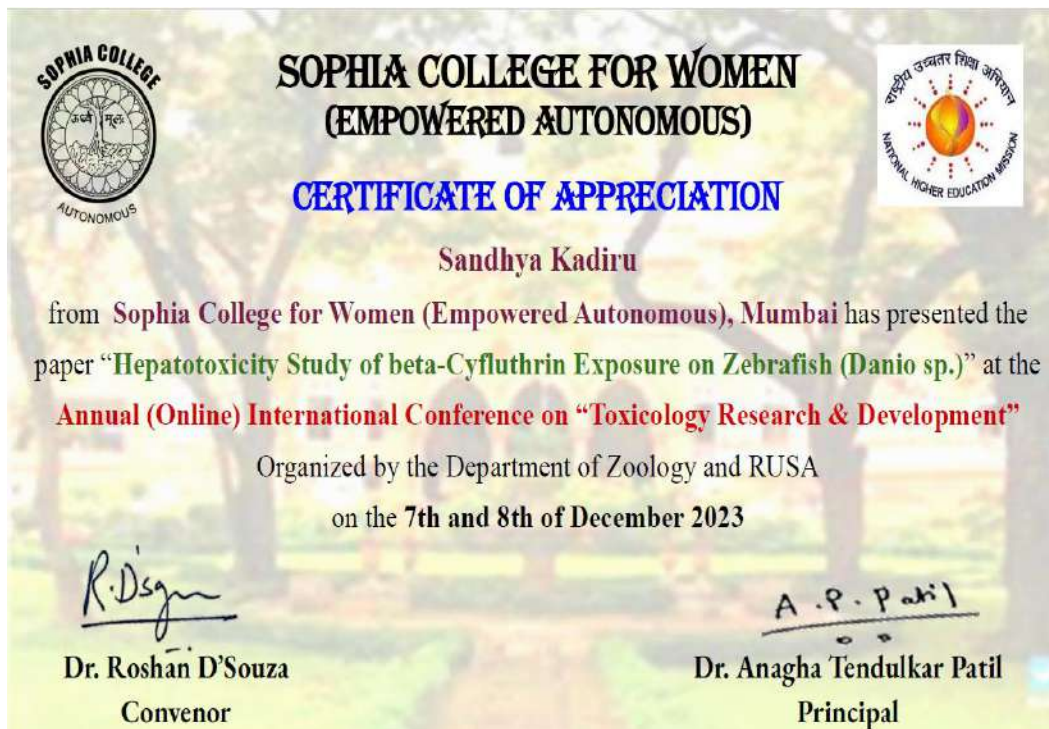
NIL

5. Mentor Mentee programs conducted by the department.

The department was a part of the Mentor Mentee programme conducted by the college. One counseling session was held per term by both the teachers.

6. Research Papers Presented

1) Ms. Sandhya Kadiru presented research paper titled "Hepatotoxicity Study of beta-Cyfluthrin Exposure on Zebrafish (*Danio sp.*)" on 7th and 8th December, 2023 at a two day international conference on 'Annual (Online) International Conference on "Toxicology Research & Development"' organized by Department of Zoology, Sophia College for Women.



2) Ms. Shreya Patil, Ph. D. Scholar presented a research paper titled "Effect of Clothianidin on Developmental Exposure to Zebrafish (*Danio sp.*)" on 7th and 8th December, 2023 at a two day international conference on 'Annual (Online) International Conference on "Toxicology Research & Development"' organized by Department of Zoology, Sophia College for Women.



3) Science Day Poster Presentation by Ph.D. Scholars - 5 in no. on 28th February, 2024



4) Oral presentation at Toxin Conference (online) by Akshay Bagwe - Ph. D. Scholar (14-28 July, 2023)



KINETIC CHARACTERIZATION OF ATPase OF PLASMODIUM FALCIPARUM (PfATP4) & ITS INHIBITION BY DUTAPHRYNUS MELANOSTICTUS (SCNEIDER) SKIN EXTRACT: AN IN-VITRO STUDY

Akshay D. Bagwe, Roshan C. D'Souza & B. B. Sharma
Email: akshay.bagwe.d21002@sopiacollege.edu.in

Abstract: Bufadienolides, which are naturally present in the toxic skin secretions of toads, have recently been discovered to have a variety of antiparasitic effects. These substances are known to inhibit the activity of ATPase enzymes, thereby preventing the ATP usage in the parasites leading to their rapid death. In present study, the crude hydroalcoholic skin extract of Common Asian Toad, *Dutaphrynus melanostictus*, containing bufadienolides was evaluated for its ability to inhibit the ATPase of *Plasmodium falciparum* (PfATP4). PfATP4 was isolated from the trophozoites of *Plasmodium falciparum* 3D7 cells and its kinetic characterization was performed at varying concentrations of ATP, sodium, potassium, hydrogen, and calcium. The results obtained confirmed that PfATP4 followed Michaelis-Menten kinetics when treated with ATP, sodium, and hydrogen while no significant change in the activity was observed after the treatment with potassium and calcium. The V_{max} and K_m constant of the extract was determined in vitro which was found to be 0.06 μ g/ml. The Michaelis-Menten, Lineweaver-Burk and Eadie-Hofstee plots showed that the K_m value of the enzyme significantly increased while the V_{max} remained unaffected after extract treatment. Therefore, from this preliminary study, it could be concluded that the bufadienolides present in the skin extract possess a potential of being a strong competitive inhibitor of ATPase in *Plasmodium falciparum* and hence could be further explored as a novel antimalarial drug.

Keywords: Bufadienolides; *Melelele*; ATPase; *Plasmodium falciparum*; Common Asian Toad.

INTRODUCTION

- Plasmodium falciparum* P-type ATPase (PfATP4) plays a crucial role in maintenance of haemozoin in malarial parasites during their intraerythrocytic development cycle.
- Drugs that target PfATP4 therefore, prevent the progress of feeding as a step closer to malaria elimination in a world that is currently threatened by antimalarial resistance.
- In present study, the skin extract of Common Asian Toad rich in bufadienolides was evaluated for its potential to inhibit PfATP4 by in-vitro methods.

METHODOLOGY

- Preparation of Toad Skin Extract (TSE) rich in bufadienolides
- Kinetic characterization of PfATP4 from the trophozoites of *Plasmodium falciparum* 3D7 cells
- Determination of inhibition constant (K_i) of TSE on PfATP4
- In-vitro inhibition kinetic study of PfATP4 treated with TSE at various ATP concentrations.

PREPARATION OF TOAD SKIN EXTRACT (TSE)

Percentage Yield of TSE: 2.22%

ATPase activity of the toad skin extract was determined in vitro.

KINETIC CHARACTERIZATION OF PfATP4

Kinetics	V_{max}	K_m	K_{cat}
Michaelis-Menten	5.40	0.34	1.00
Lineweaver-Burk	4.12	0.33	1.21
Eadie-Hofstee	4.12	0.33	1.21

IN-VITRO INHIBITION STUDY

Amount Conc. (μ g/ml)	ATPase Activity
0.008	2.83
0.017	2.24
0.034	0.97
0.060	0.42
0.127	0.08

$K_i = 0.06 \mu$ g/ml

Kinetics	Without Extract	K_m	V_{max}
Michaelis-Menten	With Extract	0.30	3.40
Lineweaver-Burk	Without Extract	0.33	4.12
	With Extract	0.41	4.11
Eadie-Hofstee	Without Extract	0.33	4.12
	With Extract	0.41	4.12

CONCLUSION

From this study, it can be concluded that the skin extract of Common Asian Toad affects the binding of ATP to *Plasmodium falciparum* K_m ATPase (PfATP4), as a competitive inhibitor. Therefore, bufadienolides present in the extract could be prospective novel antimalarial compounds.

ACKNOWLEDGEMENTS

Thanks to all members of the research team for their help and support.

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THE 2ND INTERNATIONAL ELECTRONIC CONFERENCE ON TOXINS (IECT 2023)

7.. Research Grants Received

NIL

8. Research Guide for PhD students

Dr. Roshan D'Souza - Guide

9. National or International awards/fellowships received.

NIL

10. Department/ lecturers having research projects funded by Government (include RUSA), Non-Government agencies, college during the year.

Ms. Anjali Ramchandra Mali, Zoology Ph.D. student has been awarded a scholarship by Pune Knowledge Cluster to pursue a Entrepreneurship research project in Chemistry under the Wenyan Scholarship and Mentorship Program for Women in STEM Education & careers, supported by BASF Chemicals India Pvt. Ltd. She will receive a scholarship of INR 15,000.00 (Fifteen thousand only) per month for a period of 6 (six) months with effect from November 01, 2023 and a prototyping grant up to INR 6.5 lakhs (Six Lakhs, fifty thousand only),



THE PUNE KNOWLEDGE CLUSTER (PKC)

Established by the Office of the Principal Scientific Advisor to the Government of India,
Administered by the Inter-University Centre for Astronomy and Astrophysics (IUCAA).

1 November 2023

Ms. Anjali Ramchandra Mali
Mobile: 9619640666
anjali.mali.d21001@sophiacollege.edu.in

Dear Ms. Anjali Ramchandra Mali,

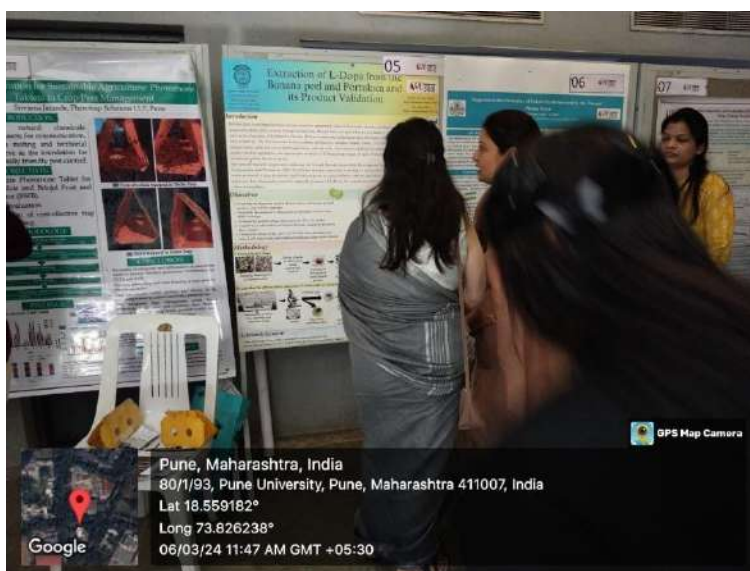
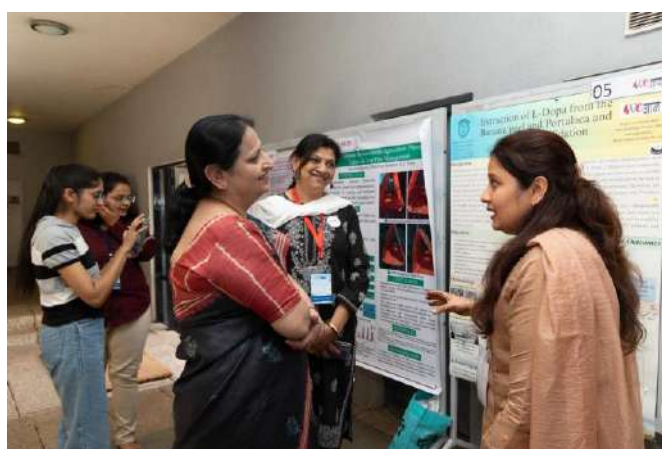
I am happy to inform you that you have been awarded a scholarship by Pune Knowledge Cluster to pursue a Entrepreneurship research project in Chemistry under the **WENyan Scholarship and Mentorship Program for Women in STEM Education & Careers**, supported by **BASF Chemicals India Pvt. Ltd.**

You will receive a scholarship of INR 15,000.00 (Fifteen thousand only) per month for a period of 6 (six) months with effect from **November 01, 2023** and a prototyping grant up to INR 6.5 lakhs (Six Lakhs, fifty thousand only), subject to your agreement of all the terms and conditions as mentioned in the **Memorandum of Agreement**.

We wish you all the best for your project and hope that this scholarship will enable you to pursue your career interests in the field of Chemistry.

Sincerely,

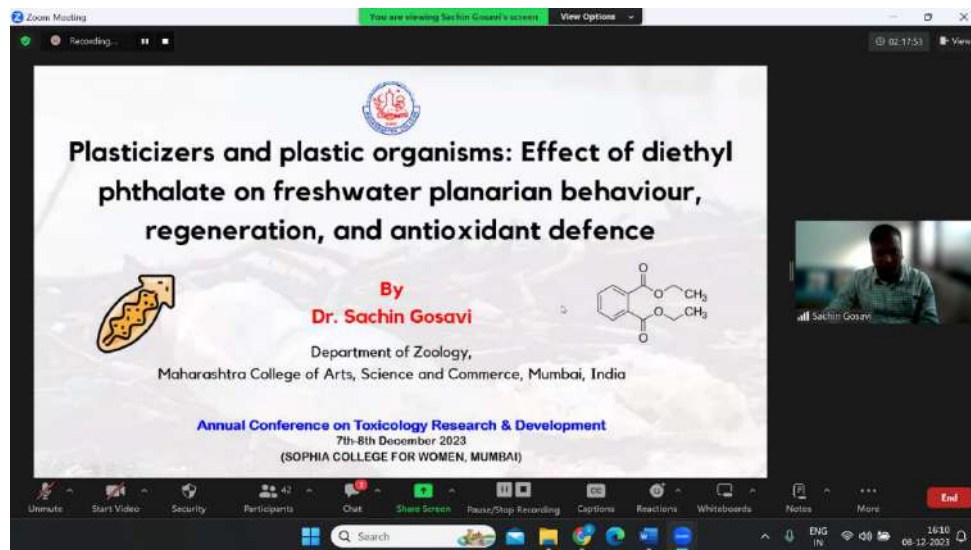
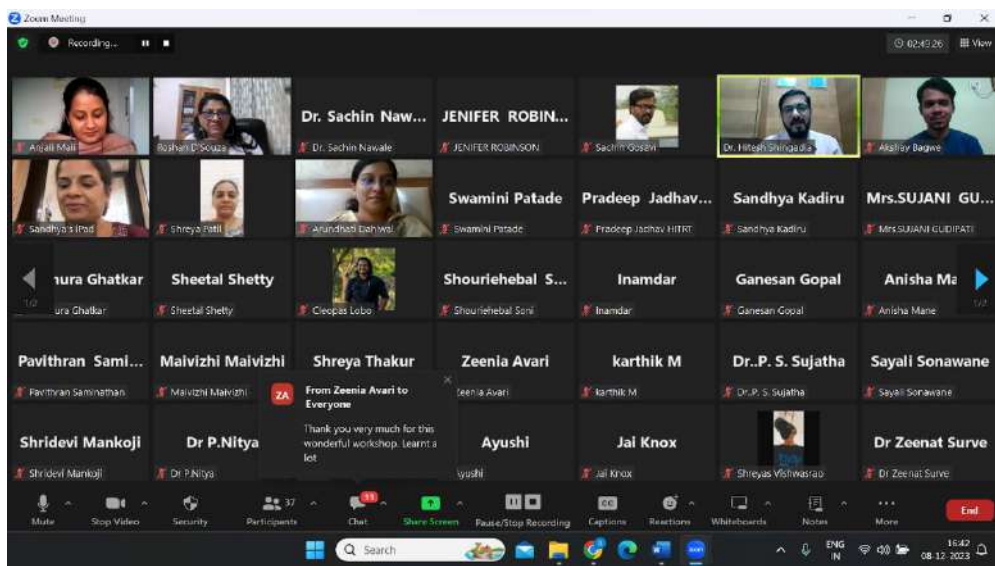
Dr. Ranganayaki Nagara
Chief Operating Officer (COO),
Pune Knowledge Cluster (PKC)



1. Workshops/seminars/ Conferences conducted during the year.

Annual Conference on Toxicology Research and Development (International Online Conference)

- Title of the activity / event – Annual Conference on Toxicology Research and Development – International online Conference
- Date (from & to) – 7th and 8th Dec. 2023
- Number of staff members involved – Two – Dr. Roshan D’Souza -Convener; Ms. Sandhya Kadiru – Organizing Committee
- Number of students involved - 82
- Guest/Speaker – Dr. Ajit Datar, Ms. Riva Pocha, Mr. Pratik Kulkarni, Dr. Kalidas Kohale
- Geotagged Photographs (please include photographs even if they are not geotagged)



Names of student participants with class – Participants all over India - 82

Aashi Parikh	Ahmedabad University
Aditi Chaudhary	Lovely Professional University
Ajitha Priya Neeraja Jammala	University of Technology and Applied Science
Akshay Bagwe	Sophia College for Women (Empowered Autonomous), Mumbai
Amrin Rashid Shaikh	Ramnarain Ruia Autonomous College, Matunga
Amruta Daulat Pharande	Sathaye College (Autonomous)
Anamika chain	Sophia College for Women (Empowered Autonomous), Mumbai
Anisha Siddharth Mane	Haffkine Institute for training research and testing
Anjali Mali	Sophia College for Women (Empowered Autonomous), Mumbai
Arundhati Dahiwal	Sophia College for Women (Empowered Autonomous), Mumbai
Asmi Aftab Alam Chishty	Sophia College for Women (Empowered Autonomous), Mumbai
Bhargavee Awadhut Sawant	Sophia College for Women (Empowered Autonomous), Mumbai
Bhavya Salian	CSMU, Panvel
Charvi Trivedi	Ahmedabad University
Cleopas Allwyn Lobo	K J Somaiya College of Science and Commerce
DARSHIKA HITESH ACHARYA	SVKM'S MITHIBAI COLLEGE
Delphine Lawrence Pereira	Royal College Mira road
Divya Karepaka	Haffkine Institute for Training Research and Testing
Dr Mrunal Ghag-Sawant	Haffkine Institute for Training Research and Testing
Dr P Nitya Jeeva Prada	Maris Stella College Vijayawada
Dr. Tussain Hussain Shah	Government Degree College (Boys) Pulwama
Dr Zeenat Surve	Maharashtra College of Arts Science and Commerce
Dr. Pooja Harihar Kini	S D.S.M. College
Dr. Sachin Madhavgir Gosavi	Maharashtra College of Arts, Science and Commerce, Mumbai
Dr. Sachin Pandurang Nawale	Walchand college of Arts and Science, Solapur
Dr. Shouriehebal Soni	SVKM'S MITHIBAI COLLEGE (Autonomous)
Dr. P.S. SUJATHA	GOVERNMENT ARTS COLLEGE
Dr. Shanti Upadhye	K J Somaiya College of Science and Commerce
Fatema Murtaza Tambawala	Sophia College for Women (Empowered Autonomous), Mumbai

FATIMA FAROOQ BEBAL	MAHENDRA PRATAP SHARADA PRASAD SINGH COLLEGE
Anuja Vijay Shete	V.G. Vaze College of Art , Science, Mulund, Mumbai
Dr. Pawankumar Kakasaheb Mudbe	GES's, Arts, Commerce and Science College, Jawhar Dist. Palghar.
Exzina Rudolf D'souza	Mahatma Phule Arts Science and Commerce college Panvel
Dr. Vikrant B Berde	Arts, Commerce and Science College Lanja
Ganesan. G	Government Art's College (Autonomous) Coimbatore
Heena Mehboob Baig	Haffkine institute for research and training
Inamdar Aafreedasaba Fazal Ahmed	Radhabai Kale Mahila Mahavidyalaya
Dr. Jai Knox	Wilson College, Mumbai
Avileli Joanna Sravya	SASHA Medical College, Guntakal
Jobin George	Sonopant Dandekar College, Palghar
M. KARTHIK	Government arts college, Coimbatore
Madhura Pramod Ghatkar	Haffkine Institute for Training Research and Testing
Madiha Mulla	Sophia College for Women (Empowered Autonomous), Mumbai
V Maivizhi	Government Arts college (Autonomous), coimbatore - 641018
Marwa Abdur Rab Walele	D.Y Patil University of Biotechnology and Bioinformatics
Meha Deepak Mepani	SVKM's Mithbai college of arts Chauhan institute of science and Amrutben jivanlal college of Commerce and Economics
Ms. Sabha Shaikh	S.S. & L.S. Patkar - Varde College
Neha Mohd Taqui Shaikh	Sophia College for Women (Empowered Autonomous), Mumbai
Nithyasanthoshini Kodurupaka	Sophia College for Women (Empowered Autonomous), Mumbai
Ms. Nihira Sanjay Deollikar	V.G. Vaze College (Autonomous), Mulund
S. Pavithran	Government Arts College (Autonomous), Coimbatore- 641 018.
Pradeep J Jadhav	Haffkine Institute for Training, Research and Testing
Pranali Shailesh Shirsat	V.G. Vaze College of Science, Mulund.
Roshan D'Souza	Sophia College for Women (Empowered Autonomous), Mumbai
Sanika More	Sophia College for Women (Empowered Autonomous), Mumbai
Mayur Shravan Naik	Mahatma Phule Arts, Science and Commerce College Panvel
Ms Meghna Verma	K J Somaiya College of Science and Commerce
MEGHNA S CHAUHAN	ATMIYA UNIVERSITY, RAJKOT
Nasir Firoj Shaikh	Y.C Warana Mahavidyalaya, Warananagar.
Paridhi Dwivedi	Sophia College for Women (Empowered Autonomous), Mumbai

Dalvi Prachiti Harishchandra	Sophia College for Women (Empowered Autonomous), Mumbai
Afida Idrisi	Sophia College for Women (Empowered Autonomous), Mumbai
Sahana Kumara Subramanian	Sophia College for Women (Empowered Autonomous), Mumbai
Sakshi gupta	Sophia College for Women (Empowered Autonomous), Mumbai
Sandhya Kadiru	Sophia College for Women (Empowered Autonomous), Mumbai
Sayali Rajendra Sonawane	Patkar-Varde College
Sheetal Sudhakar Shetty	Haffkine Institute for Training, Research and Testing
Shreya Patil	Sophia College for Women (Empowered Autonomous), Mumbai
Shreya Vilas Thakur	Haffkine Institute for Training, Research and Testing
Shreyas Daulat Vishwasrao	Haffkine Institute for Training, Research and Testing
Mankoji Shridevi Laxman	Haffkine Institute for Training, Research and Testing
Shubham Ramesh Rathod	Shri RLT College of Science, Akola
Simeen Rumani	B. N. B. Bandodkar College of Science, Affiliated to the University of Mumbai
Soha Siddiqui	VPM's B. N. Bandodkar College of Science (Autonomous)
Sree R Nair	Sophia College for Women (Empowered Autonomous), Mumbai
Swamini Vasant Patade	Sophia College for Women (Empowered Autonomous), Mumbai
Umme Aiman Mithaiwala	Sophia College for Women (Empowered Autonomous), Mumbai
VARSHA KUSHWAHA	Chhatrapati Shivaji Maharaj University
Veena Dongare	Smt.C.H.M College, Ulhasnagar
Vind Kumar Tiwari	Smt.C.H.M College, Ulhasnagar
Zeenia Avari	Jai Hind College
Ayushi Singh	SVKMS' Mithibai College, Mumbai

12. Workshops/seminars/ Conferences conducted on Intellectual Property Rights (IPR), during the year.

NIL

13. Workshops/seminars/ Conferences conducted on Gender related issues (IPR), during the year.

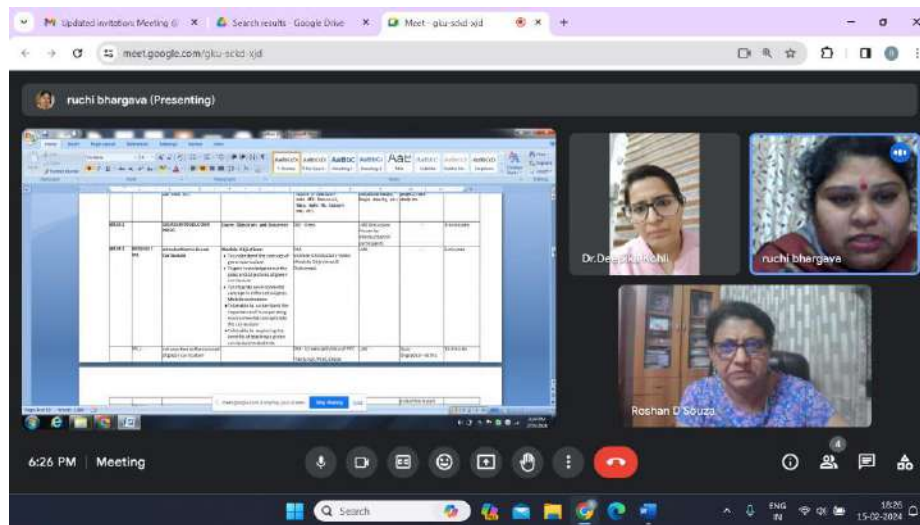
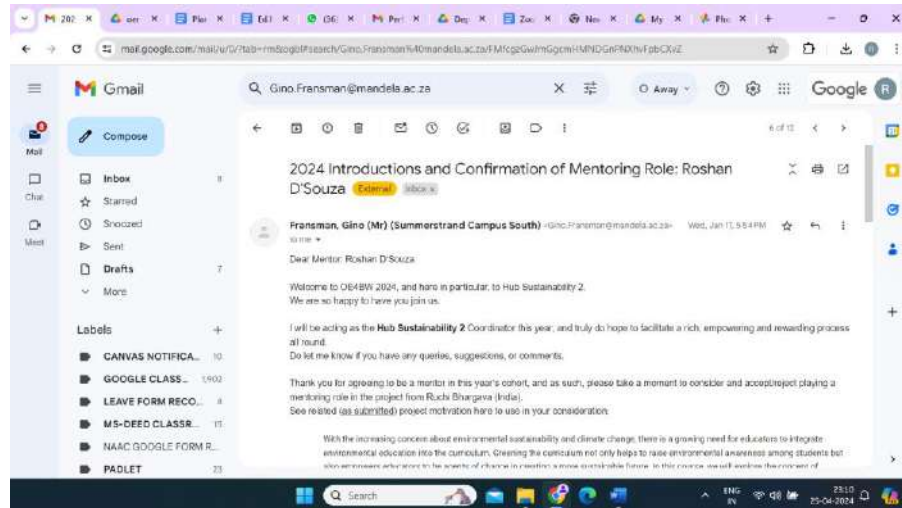
NIL

14. Extension activities carried out in the neighborhood sensitizing students to social issues for their holistic development

NIL

15. E-content development.

Dr. Roshan D'Souza : Mentoring the e-content development of MOOC : Educator Empowerment through Greening the Curriculum under the OE4BW-UNESCO Online Mentoring Program



16. Capacity Development and Skill Enhancement activities organized for improving students' capabilities; like Soft Skills, Language and Communication Skills, Life Skills (Yoga, Physical fitness, Health and Hygiene) & Awareness of Trends in Technology.

Skill enhancement activity : Practising Mindfulness

Session on Meditation to relieve stress and help in time management

Resource person : Ms. Shanti Pise, The motivational speaker from UK

Zoom Meeting You are viewing shantipse's screen View Options

Roshan D'Souza shantipse Samika Pandey S22019 Sandhya Kodiru A23031 Samreen... Afreen A23205

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**Sophia College for Women
(Autonomous)**
Zoology Department celebrates
Ananya (2023-2024)
Join us for an enlightening evening with
Ms. Shanti Pise from London, UK
Saturday 3rd February, 2024 at 6.00 PM

**Practicing
Mindfulness**



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Zoom Meeting You are viewing shantipse's screen View Options

Roshan D'Souza shantipse Samika Pandey S22019 Sandhya Kodiru S22134 Afroa Jarris Yasmin Tinwala... A23380

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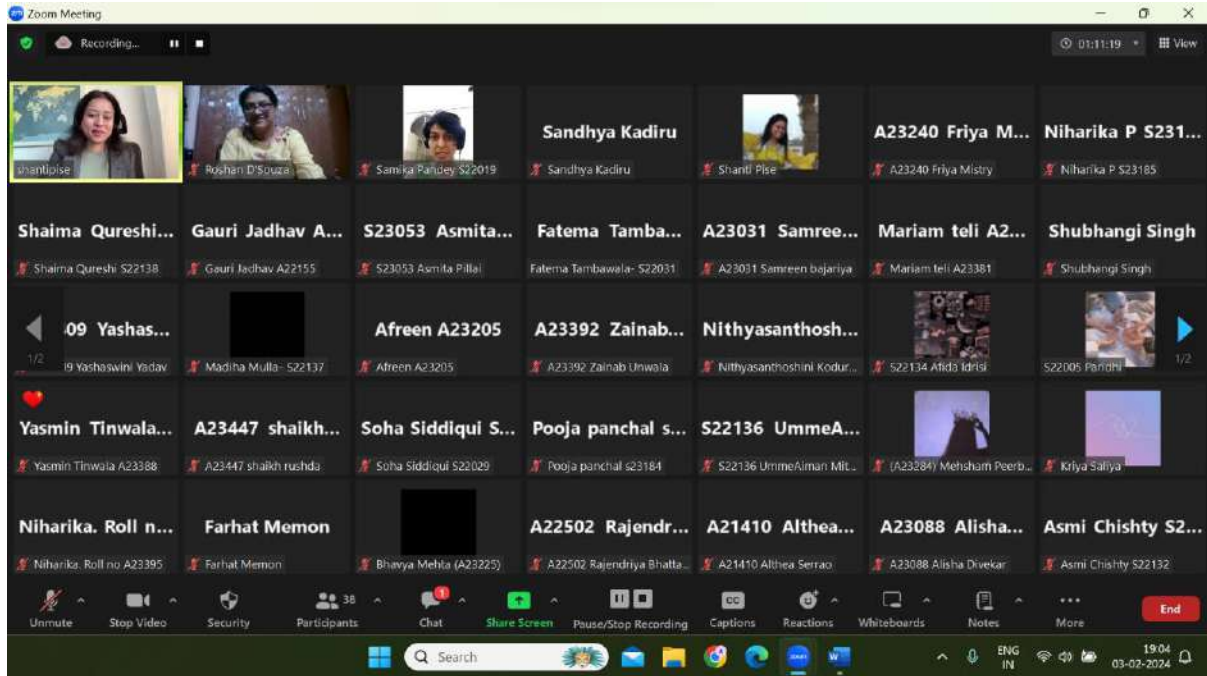


**Mindfulness Meditation
Mantras!**

1. Practice regularly
2. Be with nature
3. Exercise
4. Listen to your body
5. Have a break
6. Eat mindfully
7. Slow down
8. Move with consciousness

Unmute Stop Video Security Participants 40 Chat Share Screen Pause/Stop Recording Captions Reactions Whiteboards Notes More End

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17. Guidance/coaching for competitive examinations and career counselling offered to students.

NIL