

Laboratory of Applied Biotechnology

Mrs. Varsha Kelkar-Mane (MSc, PhD)

Associate professor

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Area of Research: *Applied Biotechnology with emphasis on societal applications*

Educational Qualifications

Ph.D.	Mumbai University	1999-2003	Applied Biology
M. Sc.	Institute of Science Mumbai University	1996-1998	Biochemistry
B. Sc.	Sophia College, Mumbai University	1993- 1996	Microbiology/ Biochemistry

Professional back ground

From	To	Designation	Organization
January 2005	On going	Associate Professor	Mumbai University
January 2003	December 2004	Project Fellow	NEERI, MuZI

Administrative Background

From	To	Designation	Organization
2016	2019	Project coordinator/manager for project titled Internationalized Master Degree Education in Nano electronics in Asian Universities.	Funded by Erasmus+
2017	ongoing	Chairperson Adhoc BoS and RRC in Biotechnology	Mumbai University
2015	ongoing	Coordinator Global Initiative of Academic Networks	Mumbai University
2007	2013	Head, dept. of Biotechnology	Mumbai University
2008	2017	Member Adhoc committee UG and PG courses & RRC in Biotechnology	Mumbai University
2015	ongoing	Member RRC in Microbiology	Mumbai University
2012	2013	Member of Academic committee	IJSO, International Junior Science Olympiad
2009	2012	Nominee of Institutional Biosafety Committee	DBT, Government of India nominee
2011	2011	Member of selection committee	Biotech Consortium India Limited, Government of India

PhD students record

Topic	Name of the scholar	Status	Year of registration	Current designation and employee
Iron oxide Nanoparticles: Synthesis, physicochemical characterization and invitro biological applications	Ms Priyanka Kambli	Degree awarded 2018	May 2013	Scientist B NIIH, ICMR, Parel
Microbiological analysis of archival documents and plasma treatment for their preventive and curative remediation	Ms Salgo Merin	Thesis submitted	March 2014	Viva Awaited
Studies on freshwater microalgae; regulation of gene expression as a function of environmental cues.	Ms Sneha Sawant	Thesis submitted	May 2015	SRF, NIIH, ICMR, Parel
Symbiosis of microalgal cultivation and environmental remediation	Ms Sarita Tanwar	Work in progress	August 2016	
Processing natural fibers: A biotechnological approach	Ms Saraswati Gupta	Work in progress	2018	
Bio-valorization of chitin for optimized production of varied applications of chitosan	Ms Shamal Pawar	Work in progress	2018	

Invited talks

Sr no	Title	Place and organized by	Date and Year
1	Archives- History, Analysis and Science	UGC-HRDC, Mumbai University's Refreshers course in Bio-Sciences; Present Trends in Biosciences;	24 th Oct 2017
2	Bio-deterioration and Preservation of Polymers	Society for Biological Chemists, UM DAE CEBs	19 th August 2017
3	Nanotechnology, Past, Present and Future	Refresher Course on the theme of Nanoscience and Nanotechnology;	21 st April 2017
4	History of earth and Fossilization	Viva College, Mumbai	4 th Feb 2017
5	Microbial contribution to the existence and evolution of life on earth	Indian Museum, Kolkata	9 th Nov 2016
6.	Mind What You are Breathing	ASET, TIFR	11 th July 2014
7.	Carbon and life Carbon tuned AMS	TIFR and Dept of Physics, University of Mumbai	9 th -10 th April 2013,

Sponsored and collaborative Projects

1. Erasmus+ Sanctioned; Internationalized Master Degree Education in Nano electronics in Asian Universities. 2016-2020
2. "Microalgae Cultivation –An Effective Solution to Air Pollution" MMR EIS-2017-2019.
3. Environmental remediation of lake water using the floating wetlands. CSR 2013
4. Study of the PCR enhancing efficiency of Transition metal – DST Purse; April 2011-14
5. Preservation of archival documents and microbial biodeteriogens database preparation for archival documents – Directorate of Archives, Govt of Maharashtra; May 2012
6. Green cosmetics- University with Potential for Excellence Green technology scheme 2012
7. Microbial degradation studies of plasma treated and untreated Poly (ϵ -caprolactone).- In collaboration with Institute of Chemical technology, Mumbai 2010-2015

Projects completed

1. Study of microbial dynamics in a constructed wetland- 2008-09
2. Persistence and Characterization of Bioaerosols in and around Siddhivinayak temple in Mumbai city 2008-09.

Summer and Winter Internships in the lab:

Every year the laboratory gets numerous applications for summer as well as winter internships. Students are selected on the basis of their SOPs every year for a short term project that gives them hands on training on varied instruments available in the laboratory as well as elsewhere on the campus.

The students are encouraged to design a minor research proposal, taught to the use of websites and read research papers. Writing proposals is also an important part of their research training. Our interns have represented at various state as well as National symposia and displayed their research work.

Sr.No	Name of the Student	Title of the thesis	Year of completion
<i>Mumbai University Project Students</i>			
1	Neha Manoti	Isolation, characterization and identification of cholesterol degrading micro-organisms present in solid waste sample of soap industry	2017-18
2	Rahul Gupta	Study of extracellular polysaccharide production by a novel alkaliphile <i>Bhargavaea beijingensis</i>	2017-18
3	Nikita Parab	Biofertilizer effect of algae isolated from paddy fields	2017-18
4	Rohit Thange	Chemical synthesis of TiO ₂ nanoparticles and their effective utilization as UV protectors	2017-18
5	Ricky Gawai	Isolation and characterization of microalgae from hot spring	2017-18
6	Sajari Raut	Investigation of hydrophobic plant material and its application in effluent treatment	2017-18
7	Dhiraj Kambli	Biovalorization of chitin	2017-18
8	Ambika Wuthoo	Isolation and characterization of Bioaerols from Mahalakshmi temple	2017-18
9	Shailesh Bisht	Photosynthesis of silver nanoparticles using <i>Moringa olifera</i>	2017-18
10	Sumit Mishra	Comparison Of The Nutraceutical Potential Of Spirulina And Novel Isolate Of Cyanobacteria	2016-2017
11	Annie Mohod	Iron nanoparticles – optimization of synthesis and Determining the enzyme activity modulations	2016-2017
12	Kaushal Vartak	Characterization of <i>Bacillus tequilensis</i> and assessment of its antimicrobial activity	2016-2017

13	Apurva Sawant	Validation of surface sampling techniques and isolation, characterization and identification of microorganisms from shopping mall.	2016-2017
14	Shreya Goregaonkar	Characterization of a novel alkaliphile and extraction and partial purification of its amylase.	2016-2017
15	Sweta Mohakar	Assessment Of Spirulina In Bioremediation Of Lake Water	2014-2015
16	Priyanka Murkute	Effect Of Copper On Growth And Antioxidant Potential Of <i>Chlorella emersonii</i> KJ725233	2014-2015
17	Bela Save	Synthesis of Iron oxide nanoparticles and its interaction with amylase	2014-2015
18	Chetan Ahire	Effect of copper as ions and salts on microbes	2014-2015
19	Dhrutika Dedhia	Role of micro-organisms in mineralization	2014-2015
20	Jennifer Raseetha	Sampling and characterization of archival documents.	2014-2015
21	Ankita Anavkar	Isolation and partial characterization of an antifungal molecule produced by Bacillus HD2	2014-2015
<i>Other University students</i>			
22	Puja Verma	Biochemical Characterization of Micro-Algal Consortia: For Food and Feed. Jaipur National University	2015-2016
23	Khushboo Sharma	Study of enzyme – nanoparticle interaction Jaipur National University	2015-2016

Paper publications (a few papers through the years have been represented as below)

Dr Varsha has served as reviewer for various National as well as International journals like Scientific reports, Nature, *PlosOne*, Wetlands, Current Science etc

The projects undertaken by the Applied Biotechnology laboratory have been diverse and the publication outcomes belong to three major areas as below:

Title of project: Nanoparticles – biological interactions

1. Assessing the enzyme modulating and antimicrobial efficiency of *Moringa* capped silver nanoparticles for their potential use as fodder supplement; Ms Saraswati Jaiswal, Mr Shaliesh Bisht and **Varsha Kelkar Mane** Research Journal of Life Sciences, Bioinformatics, Pharmaceutical, and Chemical Sciences (RJLBPCS). 2019 – 1113
2. Targeting fungal menace through copper nanoparticles and Tamrajal, Rinky Mudiar, **Varsha Kelkar-Mane**. Journal of Ayurveda and Integrative Medicine, xxx1-6; ISSN: 0975-9476; <https://doi.org/10.1016/j.jaim.2018.02.134>

Nanosized Fe₃O₄; an efficient PCR yield enhancer- Comparative study with Au, Ag Nanoparticles, Priyanka Kambli and **Varsha Kelkar-Mane**; Colloids and Interfaces B: Bio interfaces ISSN 0927-7765; Impact factor 4.4 2016

3. Attenuation of lysozyme amyloid cytotoxicity by SPION-mediated modulation of amyloid aggregation; Aafreen Naik, Priyanka Kambli, Mohanish Borana, Neha Mohanpuria, Basir Ahmad, **Varsha Kelkar-Mane** and Uma Ladiwala; International Journal of Biological Macromolecules 2015, 2015 March; 74:439-46. doi: 10.1016/j.ijbiomac.2014.12.040. Epub 2015 Jan 3
4. Enhancement in Efficiency of Polymerase Chain Reaction by Silver Nanoparticles, Mudiar Rinky Hemanta and **Kelkar Varsha**, International Research Journal of Biological Sciences. Vol. **3(2)**, 30-33, February (**2014**); ISSN 2278-3202 International Peer Reviewed

Filed an Indian patent titled ‘A low cost magnetite nano particle system for higher product efficiency in polymerase chain reaction’ vide application nos 201621014468 dated 26th April 2016.

Title of project: Archival papers and polymers structure, preservation and deterioration

6. Physico-chemical assessment of bio deteriorated and biodegraded archival paper, **Varsha Kelkar-Mane** Salgo Merin Jacob, Jenifer Raseetha, 2017, Journal International Journal of Conservation Science, Oct-Dec 2017, Vol. 8 Issue 4, p 607-618. 12p.
7. Effect of TEOS plasma polymerization on Corn Starch/Poly(e-caprolactone) film: characterization, properties and biodegradation, Gauri Arolker, Salgo Merin, **Varsha Kelkar-Mane**, Ranjendra Deshmukh *RSC Advances*, 2016, **6**, 16779 – 16789; Impact factor 3.8; ISSN nos 2046-2069
8. The Study of Air-Plasma Treatment on Corn Starch/Poly(ε-caprolactone) Films, Gauree Arolkar, Salgo Merin, **Varsha Kelkar-Mane**, R.R Deshmukh, Polymer degradation and stability, July 2015; ISSN 0964-8305
9. Bacillus species as an intrinsic controller of fungal deterioration of archival documents. Salgo Merin, Ashok Bhagwat, **Varsha Kelkar-Mane**. Vol 104; 2015; pg 46-52 International journal of Biodegradation and bio deterioration; doi:10.1016/j.ibiod.2015.05.001 Impact factor 2.44

Title of project: Applied Microbiology

10. Morpho structural changes induced in *E.coli* exposed to copper ions in water at increasing concentrations, Priyanka Kambli, Ashutosh Valawade, D.C. Kothari, **Varsha Kelkar-Mane** World journal of Pharmaceutical Research, Vol 4 Issue 10; 837-852; 18th Sept 2015, ISSN 2277-7105.
11. Study of bacterial contaminants in local as well as branded Lipsticks before and after consumer use, International journal of recent advances in multidisciplinary research, Sneha Sawant, **Varsha Kelkar-Mane**, vol 02, issue 01, pp0149-0154, January 2015; Impact factor 1.005; ISSN nos 2350-0743
12. Study of bio-aerosols in a prominent temple in Mumbai City, India; Shraddha Mehta, Priyanka Kambli, Kirti Wani, Shraddha Tanavde, Swapnil Mirgal, **Varsha Kelkar-Mane** & Rakesh Kumar August (2013) International Journal of Environmental Studies. Peer Review Integrity. ISSN 0020-7233 ; pp 17-22
13. Studies on degradation efficiency of polycaprolactone by a naturally occurring bacterium. Mustafa Motiwalla, Priyanka Punyarthi, Mansi K Mehta, Jacinta S D'souza and **Varsha Kelkar-Mane**, Jr of Environmental Biology, Vol 34, January 2013. ISSN: 0254-8704; CODEN: JEBIDP; Impact factor 0.68

Title of project: Bioprospecting-Phycoactives

14. Nutritional profile, antioxidant, antimicrobial potential and bioactives profile of *Chlorella ermersonii* KJ725233, S S Sawant and **Varsha Kelkar Mane** Asian J Pharm Clin Res, 2018
15. Striking Synergism between Water Quality Restoration and Algal Single Cell Protein (SCP) Production. **Varsha Kelkar Mane**. Sneha Sunil Sawant, Sweta Mohakar, 2017 International Journal of Pharma and Biosciences
16. Correlating the Anti –Aging Activity with the Bioactive Profile of *Chlorella emersonii* KJ725233; its Toxicological Studies for a Potential use in Cosmeceuticals Sneha Sunil Sawant, **Varsha Kelkar Mane** 2017, Pharmacognosy Communications, Vol 7 Issue 4, p152-157, DOI : 10.5530/pc.2017.4.22
17. Effect of copper on the generation time and antioxidant potential of a novel isolate of *chlorella emersonii* KJ725233, Sneha Sunil Sawant, Priyanka Murkute, A. M. Bhagwat, **Varsha Kelkar Mane**. International journal of pharmacy and Pharmaceutical Sciences, ISSN-0975-1491 Vol 8, Issue 3, 2016.
18. Constructed Wetlands and Phycoremediation, **Varsha Kelkar-Mane** Proceedings of UGC sponsored National Seminar on “Recent trends in Environmental Waste Management” held in KLE Society’s Gudleppa Hallikeri College Haveri 15th & 16th October 2015. ISBN 978-81930850-5-9 pages 13-22
19. Tapping the antioxidant potential of a novel isolate- *chlorella emersonii*, Sneha S. Sawant, Animesh A. Joshi Dr. Ashok Bhagwat, **Dr. Varsha Kelkar- Mane** World journal of pharmaceutical research. Vol 3 Issue 7; 726-739, 2014; Imapct factor 5.99; ISSN 22777105
20. Comparative analysis of physicochemical parameters and Bio-accumulation between Musa species by Rinky Mudiar, Ankush Thakur and **Varsha Kelkar**, accepted for publication in Journal of Biodiversity and Environmental Sciences (JBES); pISSN: 2220-6663; e ISSN 2220-6663 Impact factor 1.028, 2014
21. The Comparative study of Antioxidant activity of leaves and stems of *Clitoria Ternatia* L. Kajal Popat, Priyanka Kambli, Arundhati Chakrabarty and **Varsha Kelkar-Mane** Bionanofrontiers, Vol 7, Issue 12; January 2014, 38-47; ISSN 0947-0678;

22. Analysis of traditional food additive kolakhar for its physico-chemical parameters and antimicrobial activity, Rinky Mudiar, **Varsha Kelkar-Mane**, Ashok Bhagwat, Eur Academic Research, Vol II, Issue 8, Nov 2014; 10531-10536 e-ISSN 22864822; Impact factor 3.45

NCBI publications: 21

Papers presented at National, International Conference / Seminar

1. Salt induced boosting of proteins, carotenoid and antioxidant content of *Chlorella emersonii* KJ725233. Sneha Sunil Sawant, **Varsha Kelkar Mane**. National Conference on Biodiversity, Biology and Biotechnology of Algae organized by the Centre for Advanced Studies in Botany, University of Madras on 9-10th January 2017.
2. Striking synergism between water quality restoration with algal single cell protein production. Sneha Sunil Sawant, **Varsha Kelkar Mane**. International Conference on Environment Management and Sustainability organized by Indian Institute of Environment Management, SIES Nerul from 4th – 6th January 2017.
3. Green synthesis of zinc oxide nanoparticles by *Carica papaya* and study of its antibacterial activity. Peyton Yeh, Sneha Sunil Sawant, **Varsha Kelkar Mane**, H. Muthurajan. International Conference on Material Science and Technology held at University of Delhi from 1st – 4th March 2016.
4. Study of Antimicrobial Activity of Perovskite Nanocubes Sodium Potassium Niobate ($\text{Na}_{0.5}\text{K}_{0.5}\text{NbO}_3$), Deepak Mohan Kapse^{1*}, Varsha Kelkar-Mane², H. Muthurajan, Welcome to The 6th World Congress on Biotechnology (5-7th Oct 2015, New delhi)

Chapter in Book

‘Not so quite has flown Iravati’ Title of the book ‘Lilavati’s daughters’ The Women Scientists of India; Edited by Rohini Godbole, Ram Ramaswamy; published by the Indian Institute of Science, Bangalore, ISBN 978-81-8465-005-1, Page no 17-20

Memberships of organizations

1. Member of Association of Microbiologists
2. Member of ABLE (Asociation of Biotechnology LED enterprise)



Laboratory of Applied Biotechnology

L-R Dr Sneha Sawant, Ms Salgo Merin, Dr Priyanka Kambli, Dr Varsha Kelkar-Mane,
Ms Saraswati Gupta, Ms Shamal Pawar, Ms Sarita Tanwar