Dr Komal Agrawal (PhD)

@ komalagarwal935@gmail.com **+(+91) 7001812249**

ORCID-id- https://orcid.org/0000-0003-2317-7928
Research Gate-https://www.researchgate.net/profile/Komal_Agrawal5
Google Scholar-https://scholar.google.com/citations?user=8ELvmBsAAAAJ

Citations – 861 **h-index – 14** **i10-index - 21**

EDUCATION

- **Ph.D. in Microbiology**

Central University of Rajasthan
2014-2021 India

- **MSc in Microbiology**

Sikkim University (A Central University - India)
2011-2013 India

AWARDS AND HONOURS

- "**Best Paper**" **Award**

1st International Conference on Biotechnology and Biological Sciences- BIOSPECTRUM 2017
2017 India

- **Silver Medallist (MSc)**

Sikkim University
2013 India

RESEARCH EXPERIENCE

- **Ph.D. (2014-2021)**

Thesis: "*Production, Characterization, and Applications of Laccases from Fungal Strains of Rajasthan, India*"

✓ It was an amalgamation of biostatistical, in-silico, and experimental studies
✓ Robust fungal biodiversity of Rajasthan was explored followed by screening and identification of laccase positive fungal cultures
✓ Production, biostatistical optimization, and developing biobased purification system for laccase using an aqueous two-phase system
✓ Intensive proteomics, in-silico, technical and experimental study for the characterization of laccases
✓ Developing zero-waste-sustainable application methodologies using laccase and its critical characterization and analysis

- **MSc (2011-2013)**

Dissertation: "Studies on some characteristics features of *Saccharomycopsis fibuligera*"

✓ The work was aimed at the identification of yeast from the mixed starter culture '*marcha*'
✓ Extensive collection and screening of the sample and determining its sugar fermentation and assimilation abilities

COLLABORATIONS DURING PhD

- **Academic:**

✓ Dr. Jata Shankar, Associate Professor, Genomics Laboratory, Department of Biotechnology and Bioinformatics, Jaypee University of Information Technology, Solan 173234, Himachal Pradesh, India
✓ Dr. Venkatesh Chaturvedi, Assistant Professor, aSchool of Biotechnology, Institute of Science, Banaras Hindu University, Varanasi, 221005, Uttar Pradesh, India

- **Industrial:**

✓ Agilent Technologies Center of Excellence Manesar, Gurugram India - LCMS Q-TOF analysis

TRAINING/SKILLS

- Highly competent with various computer software's: Word, Excel, PowerPoint, Origin, Design expert, and Mass hunter,
- Competent with characterization and interpreting data using: LC-MS, FTIR, XRD, UV-Visible spectrophotometer, SDS-PAGE, zymography, DNA gel electrophoresis, PCR, TLC, microscopy
- Highly competent with basic microbiological techniques, isolations of fungal, bacterial, and algal cultures, biochemical identification, culturing, fermentation, microscopy.

TEACHING/SUPERVISION

The involvement with PhD, MSc and BSc candidates consists of an extensive emphasize on initial 6 months on literature review followed by an amalgamation of i.e., experimental, and in-silico studies

- **Ph.D. Candidates-2 (Current)**

The PhD scholars are currently being trained in both laboratory work and paper writing and communications.

✓ The candidate enrolled in 2019 has resulted in the publication of 5 review articles and 3 under process in the area of microalgae
✓ The candidate enrolled in 2020 has 1 review communicated with 1 under process in the area of biorefinery and environmental sustainability

- **MSc Dissertation Candidates-10**

- ✓ Bioremediation of pharmaceuticals diclofenac and chloramphenicol using laccase from white-rot fungi: an experimental and in-silico analysis
- ✓ An experimental and in-silico study of fungal xylanase and its applications in fruit juice and paper industry
- ✓ Pretreatment of agrowastes: an experimental and in-silico study
- ✓ Biological pretreatment of agricultural residues using cow dung: a sustainable approach
- ✓ Dual role of microalgae: biodiesel production by *Chlorella* sp. and isolated strain *Zygnema* sp. with simultaneous phycoremediation of sewage wastewater
- ✓ Utilization of fungal cultures in the generation of electricity by MFC and saccharification of lignocellulosic biomass
- ✓ Integrated approach of bioremediation and electricity generation employing cyanobacterial cultures
- ✓ Microbial fuel cell assisted bioremediation of industrial effluents and simultaneous bioelectricity generation
- ✓ Bioremediation of textile industry dyes and treatment of sludge generated during the process \
- ✓ Decolorization of textile dyes with isolated fungal strains

- **BSc Dissertation Candidates-2**

- ✓ Isolation and identification of bacteria from soil and water samples from CURAJ campus
- ✓ Isolation, identification and characterization of microalgae

PUBLICATIONS: RESEARCH AND REVIEW PAPERS

1. Goswami et al. (2022). An exploration of natural synergy using microalgae for the remediation of pharmaceuticals and xenobiotics in wastewater. *Algal Research*. https://doi.org/10.1016/j.algal.2022.102703
2. Goswami et al. (2022). Microalgal-based remediation of wastewater: A step towards environment protection and management. *Manag Environ Qual*. https://doi.org/10.1002/tqem.21850
3. Singh et al. (2022). Bio-inspired remediation of wastewater: A contemporary approach for environmental clean-up. *Curr Opin Green Sustain Chem*.https://doi.org/10.1016/j.crgsc.2022.100261
4. Goswami et al. (2021). Multifaceted Role of Microalgae for Municipal Wastewater Treatment: A Futuristic Outlook towards Wastewater Management. *CLEAN–Soil, Air, Water*. https://doi.org/10.1002/clen.202100286
5. Goswami et al. (2021). Microalgae *Dunaliella* as biofuel feedstock and β-carotene production: An influential step towards environmental sustainability. *Energy Convers Mana.* https://doi.org/10.1016/j.ecmx.2021.100154
6. Bhardwaj et al., (2021) Current perspective on production and applications of microbial cellulases: a review. *Bioresour Bioprocess*. https://doi.org/10.1186/s40643-021-00447-6
7. Goswami et al. (2021). Current perspective on wastewater treatment using photobioreactor for *Tetraselmis* sp.: an emerging and foreseeable sustainable approach. *Environ Sci Pollut Res*. https://doi.org/10.1007/s11356-021-16860-5
8. Goswami et al. (2021). Bioremediation of heavy metals from wastewater: A current perspective on microalgae-based future. *Lett Appl Microbiol*. doi:10.1111/lam.13564
9. **Agrawal**, et al. (2021) Microbial cell factories a new dimension in bio-nanotechnology: exploring the robustness of nature. *Crit Rev Microbiol.* https://doi.org/10.1080/1040841X.2021.1977779
10. Goswami, et al. (2021) Phycoremediation of nitrogen and phosphate from wastewater using *Picochlorum* sp.: A tenable approach. *J. Basic Microbiol*. https://doi.org/10.1002/jobm.202100277
11. Chaturvedi, et al. (2021) Chicken feathers: a treasure cove of useful metabolites and value-added products. *Environmental Sustainability*. https://doi.org/10.1007/s42398-021-00160-2
12. Kumar, et al. (2021) Microbial electrochemical system: A sustainable approach for mitigation of toxic dyes and heavy metals from wastewater. *J. Hazard. Toxic Radioact Waste*. (First and second author contributed equally) https://doi.org/10.1061/(ASCE)HZ.2153-5515.0000590
13. **Agrawal**, et al. (2020) Insight into multicopper oxidase laccase from *Myrothecium verrucaria* ITCC-8447: a case study using in silico and experimental analysis. *J Environ Sci Health B*. https://doi.org/10.1080/03601234.2020.1812334
14. **Agrawal**, et al. (2020) Multicopper oxidase (MCO) laccase from *Stropharia* sp. ITCC-8422: an apparent authentication using integrated experimental and in silico analysis. *3 Biotech*. https://doi.org/10.1007/s13205-020-02399-8
15. **Agrawal** and Verma (2020) Myco-valorization approach using entrapped *Myrothecium verrucaria* ITCC-8447 on synthetic and natural support via column bioreactor for the detoxification and degradation of anthraquinone dyes. *Int Biodeterior Biodegradation*. https://doi.org/10.1016/j.ibiod.2020.105052

16. **Agrawal** and Verma (2020) Production optimization of yellow laccase from *Stropharia* sp. ITCC 8422 and enzyme-mediated depolymerization and hydrolysis of lignocellulosic biomass for biorefinery application. *Biomass Convers Biorefin*. https://doi.org/10.1007/s13399-020-00869-w
17. **Agrawal** and Verma (2020) Multicopper oxidase laccases with distinguished spectral properties: A new outlook. *Heliyon*. https://doi.org/10.1016/j.heliyon.2020.e03972
18. Bhardwaj et al. (2020) Bioconversion of rice straw by synergistic effect of in-house produced ligno-hemicellulolytic enzymes for enhanced bioethanol production. *Bioresour Technol Rep*. https://doi.org/10.1016/j.biteb.2019.100352
19. Kumar B, et al. (2020) Current perspective on pretreatment technologies using lignocellulosic biomass: An emerging biorefinery concept. *Fuel Process Technol*. https://doi.org/10.1016/j.fuproc.2019.106244
20. **Agrawal** and Verma 2020) Potential removal of hazardous wastes using white laccase purified by ATPS–PEG–salt system: an operational study. *Environ Technol Innov*. https://doi.org/10.1016/j.eti.2019.100556
21. **Agrawal** and Verma (2019) Column bioreactor of immobilized *Stropharia* sp. ITCC 8422 on natural biomass support of *L. cylindrica* for biodegradation of anthraquinone violet R. *Bioresour Technol Rep*. https://doi.org/10.1016/j.biteb.2019.100345
22. **Agrawal** and Verma (2019) Laccase: addressing the ambivalence associated with the calculation of enzyme activity. *3 Biotech*. https://doi.org/10.1007/s13205-019-1895-1
23. **Agrawal** and Verma (2019) Biodegradation of synthetic dye Alizarin Cyanine Green by yellow laccase producing strain *Stropharia* sp. ITCC-8422. *Biocatal Agric Biotechnol*. https://doi.org/10.1016/j.bcab.2019.101291
24. **Agrawal K** et al. (2019) Process optimization, purification and characterization of alkaline stable white laccase from *Myrothecium verrucaria* ITCC-8447 and its application in delignification of agroresidues. *Int J Biol Macromol*. https://doi.org/10.1016/j.ijbiomac.2018.12.108
25. Kumar B et al. (2018) Production, purification and characterization of an acid/alkali and thermo tolerant cellulase from *Schizophyllum commune* NAIMCC-F-03379 and its application in hydrolysis of lignocellulosic wastes. *AMB Express*. https://doi.org/10.1186/s13568-018-0696-y
26. Bhardwaj et al. (2019) Purification and characterization of a thermo-acid/alkali stable xylanases from *Aspergillus oryzae* LC1 and its application in xylo-oligosaccharides production from lignocellulosic agricultural wastes. *Int J Biol Macromol*.*https://doi.org/10.1016/j.ijbiomac.2018.09.070*
27. **Agrawal** et al. (2018) Fungal laccase discovered but yet undiscovered. *Bioresour Bioprocess*. https://doi.org/10.1186/s40643-018-0190-z. *(The article has been included within "The Top 10 Most Cited Articles in BIOB (2017-2019" Based on Web of Science and SpringerNature, As of May 19, 2020).*

PUBLICATIONS: BOOK CHAPTERS

1. **Agrawal** and Verma (2022). Springer https://doi.org/10.1007/978-981-16-5214-1_7
2. **Agrawal** and Verma (2022). Elsevier. https://doi.org/10.1016/B978-0-323-85839-7.00018-9
3. **Agrawal** and Verma (2022). *CRC Press*. https://doi.org/10.1201/9781003130932
4. **Agrawal** and Verma (2022). *CRC Press*. https://doi.org/10.1201/9781003165057
5. Bhatt et al. (2021) Springer, Singapore. https://doi.org/10.1007/978-981-16-5621-7_18
6. **Agrawal** et al. (2021). *RSC*. https://doi.org/10.1039/9781839165399-00087
7. **Agrawal** and Verma (2021). *RSC*. https://doi.org/10.1039/9781839165399-00241
8. Prakash et al. (2021). *CRC Press*. https://doi.org/10.1201/9781003155713
9. Bhardwaj et al. (2021). *Springer*. https://doi.org/10.1007/978-981-16-1190-2_10
10. Alam e al. (2021). *Springer*. https://doi.org/10.1007/978-981-16-1947-2_5
11. **Agrawal** and Verma (2022). *Elsevier*. https://doi.org/10.1016/B978-0-12-823499-0.00006-7
12. **Agrawal** and Verma (2021). *CRC* Press. https://doi.org/10.1201/9781003204442
13. Goswami et al. (2021). *Springer*. https://doi.org/10.1007/978-981-16-1190-2_9
14. **Agrawal** and Verma (2021). *Elsevier*. https://doi.org/10.1016/B978-0-12-823991-9.00010-1
15. **Agrawal** et al. (2021). *Springer*. https://doi.org/10.1007/978-3-030-68260-6
16. Goswami et al. (2021). *Wiley*. https://doi.org/10.1002/9781119772125.ch6
17. **Agrawal** and Verma (2021). *Academic Press*. https://doi.org/10.1016/B978-0-12-821734-4.00015-0
18. **Agrawal** and Verma (2021). *Elsevier*. https://doi.org/10.1016/B978-0-12-821881-5.00023-4
19. **Agrawal** and Verma (2021). *Elsevier*. https://doi.org/10.1016/B978-0-12-821881-5.00002-7
20. Bhardwaj et al. (2021). *Springer*. https://doi.org/10.1007/978-981-33-4195-1_11

21. **Agrawal** and Verma (2020). *Springer*. https://doi.org/10.1007/978-981-15-5901-3_13
22. **Agrawal** and Verma (2020). *Springer*. https://doi.org/10.1007/978-981-15-5901-3_24
23. **Agrawal** and Verma (2020). *Elsevier*. https://doi.org/10.1016/B978-0-12-821005-5.00001-6
24. Goswami et al. (2020). *CRC Press*. https://doi.org/10.1201/9780429317187
25. Bhardwaj et al. (2020). *Springer*. https://doi.org/10.1007/978-981-15-7190-9_7
26. **Agrawal** and Verma (2020). *Elsevier*. https://doi.org/10.1016/B978-0-12-821011-6.00005-0
27. **Agrawal** and Verma (2020). *Springer, Singapore*. https://doi.org/10.1007/978-981-15-3453-9_10
28. **Agrawal** and Verma (2020). *Elsevier*. https://doi.org/10.1016/B978-0-12-819860-5.00003-1
29. **Agrawal** et al. (2020). *Elsevier*. https://doi.org/10.1016/B978-0-12-819860-5.00007-9
30. **Agrawal** et al. (2020). *Singapore*. https://doi.org/10.1007/978-981-15-0497-6_7
31. **Agrawal** et al. (2020). *Springer*. https://doi.org/10.1007/978-981-13-8637-4_8
32. Kumar et al. (2020). *Springer*. https://doi.org/10.1007/978-981-13-8637-4_7
33. Kumar et al. (2019). *Springer*. https://doi.org/10.1007/978-981-13-8844-6_7
34. **Agrawal K** et al. (2019). *Elsevier*. https://doi.org/10.1016/B978-0-12-816809-7.00009-9
35. Kumar et al. (2018). *Springer*. https://doi.org/10.1007/978-3-319-92904-0_11

WORKSHOP AND CONFERENCES

- ✓ 1st International Conference on Biotechnology and Biological Sciences BIOSPECTRUM 2017. Abstract - "Substrate affinity of laccase and discrepancy in relation of enzyme activity""Awarded - "Best Paper"
  ✓ [25-26/08/2017] Kolkata, India
- National Conference on Emerging Trends in Fungal Biology and Plant Protection ETFPP-2016 and 42nd Annual Meeting of the Mycological Society of India (MSI). Abstract - "Bio-composites: A clean approach using fungal assisted synthesis" was represented via poster presentation
  ✓ [16-18/02/2016] Banaras, India
- National Conference on fungal biotechnology and 43rd annual meeting of the Mycological Society of India (MSI) Jaipur India. Abstract - "Laccase a green tool from various ecological niches of Rajasthan" was represented via poster presentation"
  ✓ [16-18/11/2016] Jaipur, India
- International Conference on New Horizons in Biotechnology NHBT-2015. Abstract - "Exploitation of laccase for bio-composite synthesis and dye degradation" was represented via poster presentation
  ✓ [22-25/11/2015] Kerela, India
- Workshop in Entrepreneurship in Life Sciences
  ✓ [12-14/10/2012] Gangtok,India
- RSC Desktop Seminar with Molecular Omics. Organized by RSC Publishing Webinars
  ✓ [18/03/2022]