

Resume

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Environmental Biotechnology and Genomics
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Institution : CSIR-National Environmental
Engineering Research Institute

Date of Birth : 19 February 1974

Academic Qualifications

1995 Bachelor of Science in Microbiology from University of Pune
1997 Master of Science in Microbiology from University of Pune
1998 Ph.D. in Microbiology from RTM Nagpur University
Thesis title: Production of Biodegradable Thermoplastics From
Activated Sludge
Guide's Name: Dr Tapan Chakrabarty
Place of Work: CSIR-National Environmental Engineering Research
Institute

Work Experience

1997-1998 Production supervisor at Mahyco Beneficial Microbes, Jalna,
Nature of work: production of various bioinoculants/
biofertilizers based on Rhizobium, Azotobacter, Phosphate
solubilizers etc.

1998-2001 Research Assistant at National Chemical Laboratory, Pune
Nature of work: Production of alkaline proteases from fungal
isolate and application in leather treatment

2001-2002 Senior research fellow at Dept of Biotechnology, Barkatullah
University, Bhopal
Nature of work: Evaluation of efficacy soybean crop residue
(straw) as substrate for mushroom production

2002-2005 Research fellow at Environmental Biotechnology Division, NEERI
Nature of work: Evaluate the utilization of activated sludge biomass
for their PHB accumulating potential using various agro-industrial
wastewaters

2005-till date Scientist at Environmental Biotechnology and Genomics Division,
NEERI, Nagpur
Nature of work: Leading various research project on following
themes,

Ongoing Projects

- (i)** Study of Simultaneous Denitrification and Methane Metabolism by Denitrifying Methanotrophs from Landfill Sites
- (ii)** Microbial diversity of human gut (Consultancy, sponsor- ITC Bengaluru)

Completed Projects

- (i)** Energy from Organic Waste from Small Communities (Sponsor- Nanyang Technology University, Singapore)
- (ii)** Biomethanation of Lignocellulosic Residues- Rice Straw (Consultancy, Sponsor- DSM, Pune)
- (iii)** Feasibility Studies on Biogas and Compost Production from Mule Dung in Hilly Regions in India (Govt., Sponsor- Office of PSA to Govt. of India, New Delhi)
- (iv)** Biogas from vegetable waste using baffled plug flow reactor system (Govt., Sponsor- CSIR, New Delhi)
- (v)** Production and improvement of bacterial keratinase and demonstration of feather waste management by keratinase hydrolyzing bacteria at pilot scale (Govt., Sponsor- Dept. of Biotechnology, New Delhi)
- (vi)** Redefining the treatment strategy and assessment of Microbial catabolic diversity using genomics tool at CETP, Vapi (Consultancy, Sponsor- Common Effluent Treatment Plant, Vapi, Gujarat)
- (vii)** Metagenomic study of seabuck-thorn rhizosphere (Consultancy, Sponsor- DRDO, Leh, Ladakh)

Professional Recognition/Award/Prize/Certificate, Fellowship

2010-2011 Inaugural Lien Environmental Fellowship Award, instituted by Environmental Endeavour 2-Nanyang Environment and Water Research Institute, Nanyang Technological University, Singapore

Nature of work: 6 months

For carrying out project on evaluating the efficacy of biomethanation of food/kitchen/vegetable waste in a Hybrid Anaerobic Solid-Liquid Reactor

List of Publications

1. **Khardenavis AA**, Guha PK, Suresh Kumar M, Mudlair SN, Chakrabarti T, (2005). Activated sludge is a potential source for production of biodegradable plastics from wastewater. Environmental Technology, 26 (5), 545–552.
2. **Khardenavis AA**, Suresh Kumar M, Mudliar SN, Chakrabarti T, (2007). Biotechnological conversion of agro-industrial wastewaters into biodegradable plastic, poly β -hydroxybutyrate. Bioresource Technology, 98(18), 3579-3584.
3. **Khardenavis AA**, Kapley A, Purohit HJ, (2010). Salicylic-Acid-Mediated Enhanced Biological Treatment of Wastewater. Applied Biochemistry and Biotechnology, 160(3), 704-718.
4. **Khardenavis AA**, Suresh Kumar M, Chakrabarti T, (2007). Plastics to Bioplastics. Science Reporter, 44(11), 39-42.

5. **Khardenavis AA**, Kapley A, Purohit HJ, (2007). Simultaneous nitrification and denitrification by diverse *Diaphorobacter* sp. Applied Microbiology and Biotechnology, 77, 403-409.
6. **Khardenavis AA**, Suresh Kumar M, Chakrabarti T, (2008). Biodegradable Plastics: Effective alternative for control of synthetic plastic waste. CURE Environmental Bulletin, 14, 1-7.
7. **Khardenavis AA**, Kapley A, Purohit HJ, (2008). Phenol-mediated improved performance of active biomass for treatment of distillery wastewater. International Biodeterioration & Biodegradation, 62, 38–45.
8. **Khardenavis AA**, Kapley A, Purohit HJ, (2009). Processing of poultry feathers by alkaline keratin hydrolyzing enzyme from *Serratia* sp. HPC 1383. Waste Management, 29, 1405-1415.
9. **Khardenavis AA**, Vaidya AN, Suresh Kumar M, Chakrabarti T, (2009). Utilization of molasses spentwash for production of bioplastics by waste activated sludge. Waste Management, 29, 2558-2565.
10. **Khardenavis AA**, Wang, JY, Ng WJ, Purohit, HJ, (2013). Management of various organic fractions of municipal solid waste via recourse to VFA and biogas generation, Environmental Technology, 34 (13-14), 2085-2097.
11. Puranik S, Talkal R, Qureshi A, **Khardenavis A**, Kapley A, Purohit HJ, Genome sequence of pigment producing bacterium *Pseudogulbenkiania ferrooxidans*, isolated from Loktak Lake, Genome Announcements, 2013, 1(6), e01115-13.
12. Kapley A, Sagarkar S, Tanksale H, Sharma N, Qureshi A, **Khardenavis A**, Purohit HJ, Genome sequence of *Alcaligenes* sp. Strain HPC1271, Genome Announcements, 2013, 1(1), 1, e00235-12
13. Yadav TC, **Khardenavis AA**, Kapley A, Shifts in microbial community in response to dissolved oxygen levels in activated sludge. Bioresource Technology, 2014, 165: 257-264.
14. Sagarkar S, Bhardwaj P, Yadav TC, Qureshi A, **Khardenavis A**, Purohit HJ, Kapley A, Draft genome sequence of atrazine-utilizing bacteria isolated from Indian agricultural soil, Genome Announcements, 2014, 2(1), e01149-13.
15. Qureshi A, Itankar Y, Ojha R, Mandal M, **Khardenavis A**, Kapley A, Purohit HJ, Genome sequence of *Lactobacillus plantarum* EGD-AQ4, isolated from fermented product of North-East India, Genome Announcements, 2014, 2(1), e01122-13.
16. Pal R, **Khardenavis AA**, Purohit HJ, (2015). Identification and monitoring of nitrification and denitrification genes in *Klebsiella pneumoniae* EGD-HP19-C for its ability to perform heterotrophic nitrification and aerobic denitrification. Functional and Integrative Genomics, 15(1), 63–76.
17. Thakur N, **Khardenavis AA**, Purohit HJ, (2015). Recent Advances in Factors and Methods for Stimulation of Biomethane Production. Recent Advances in DNA & Gene Sequences, 9, 3-13.
18. Deshmukh R, **Khardenavis AA**, Purohit HJ, (2016). Diverse metabolic capacities for bioremediation. Indian Journal of Microbiology, 56:247-264

19. Gulhane M, **Khardenavis AA**, Karia S, Pandit P, Kanade GS, Lokhande S, Vaidya AN, Purohit HJ, (2016). Biomethanation of vegetable market waste in an Anaerobic Baffled Reactor: Effect of effluent recirculation and carbon mass balance analysis. *Bioresour. Technol.* 215, 100-109.
20. Pandit PD, Gulhane MK, **Khardenavis AA**, Purohit HJ, (2016). Mining of hemicellulose and lignin degrading genes from differentially enriched methane producing microbial community. *Bioresour. Technol.* 216, 923-930.
21. Purohit, HJ, Kapley A, **Khardenavis A**, Qureshi A, Dafale NA, (2016). Insights in Waste Management Bioprocesses Using Genomic Tools. In S. Sariaslani, & G. M. Gadd (Eds.), *Advances in Applied Microbiology*, pp. 121–170.
22. Gulhane MK, Pandit PD, **Khardenavis A**, Singh D, Purohit HJ, (2017). Study of microbial community plasticity for anaerobic digestion of vegetable waste in plug flow bioreactor. *Renewable Energy*, 101, 59-66.
23. Fuke P, Gujar VV, **Khardenavis AA**, (2017). Genome Annotation and Validation of Keratin-Hydrolyzing Proteolytic Enzymes from *Serratia marcescens* EGD-HP20. *Applied Biochemistry and Biotechnology*, 184(3), 970-986.
24. Gujar VV, Fuke P, **Khardenavis AA**, Purohit HJ, (2018). Draft genome sequence of *Penicillium chrysogenum* strain HKF2, a fungus with potential for production of prebiotic synthesizing enzymes. *3 Biotech* 8, 106.
25. Gujar VV, Fuke P, **Khardenavis AA**, Purohit HJ, (2018). Annotation and De Novo Sequence Characterization of Extracellular β -Fructofuranosidase from *Penicillium chrysogenum* Strain HKF42. *Indian Journal of Microbiology*, 58(2), 227-233.
26. Fuke P, Pal RR, **Khardenavis AA**, Purohit HJ, (2018). *In silico* characterization of broad range proteases produced by *Serratia marcescens* EGD-HP20. *Journal of Basic Microbiology*, 58(6), 492-500.
27. Tikariha H, **Khardenavis AA**, Purohit HJ, (2018). Dissolved oxygen-mediated enrichment of quorum-sensing phenomenon in the bacterial community to combat oxidative stress. *Archives of Microbiology*, 200:1371-1379.

Books/Reports/ Chapters/General articles etc.

1. Pandit PD, Gulhane MK, **Khardenavis AA**, Vaidya AN, (2015). Technological Advances for Treating Municipal waste. In Kalia VC, (ed) *Microbial Factories*, Vol. 1 (4.1), Springer, USA, pp 217-229.
2. Sharma P, **Khardenavis AA**, Purohit HJ, (2015). Metabolism of Long Chain Fatty Acids (LCFAs) in Methanogenesis. In Kalia VC, (ed) *Microbial Factories*, Vol. 1 (4.4), Springer, USA, pp 279-291.
3. **Khardenavis AA**, Vaidya AN, Kalia VC, Purohit HJ, (2017). Recent Advances in Optimization of Environmental Bioprocesses. In: Purohit HJ, Kalia VC, Vaidya AN, Khardenavis AA (eds.) *Optimization and Applicability of Bioprocesses*, Springer Nature, Singapore, pp 1-12.

4. Deshmukh R, **Khardenavis AA**, Purohit HJ, (2017). Bioprocess for Solid Waste Management. In: Purohit HJ, Kalia VC, Vaidya AN, Khardenavis AA (eds.) Optimization and Applicability of Bioprocesses, Springer Nature, Singapore, pp 73-99.
5. Purohit HJ, **Khardenavis AA**, Vaidya AN, Kalia VC (2017). Mining the Microbial Community for Redefining the Bioprocesses in the Future. In: Purohit HJ, Kalia VC, Vaidya AN, Khardenavis AA (eds.) Optimization and Applicability of Bioprocesses, Springer Nature, Singapore, pp 409-418.
6. Fuke P, Gujar VV, **Khardenavis AA**, Purohit HJ (2018). Recent Trends in Bacterial Keratinases. In: Rai V, Kumar P (eds.) Recent Advances in Biotechnology, Shree Publishers & Distributors India, Volume 1, pp 33-52.
7. Gujar VV, **Khardenavis AA**, Purohit HJ (2018). Recent Advances in Bioprocess Optimization of Fructo-oligosaccharides. In: Rai V, (ed.) Recent Advances in Biotechnology, Shree Publishers & Distributors India, Volume 3, pp 215-238.

Papers in Conferences:

1. **Khardenavis AA**, Anaerobic baffled reactor: A system supporting flexible microbial community for sustainable exploitation of food/kitchen waste for renewable bioenergy production. 17-19 Dec. 2018, 3rd International Conference on Biological Waste as Resource 2018, The Education University of Hong Kong, Hong Kong, Hong Kong, Page No. 84.
2. **Khardenavis, AA**, Hemant J. Purohit, Designing reactors for Kitchen waste to biogas. 11-14 May 2017, 5th Bharatiya Vigyan Sammelan, Pune, India.
3. Prabhakar Pandit, Madhuri Gulhane, Hitesh Tikariha, Jayashankar Das, **Khardenavis AA**, Hemant J. Purohit, Enhancement in biogas production: Bioaugmentation study with flexible enzymatic capacity of *Pantoea dispersa* EGD AAK13. 8-10 Oct. 2017, International Conference on "Emerging Trends in Biotechnology for Waste Conversion (ETBWC – 2017)" XIV Annual Convention of Biotech Research Society India, CSIR-NEERI, Nagpur, Page no. 179.
4. Vaibhav V Gujar, Kshitiz Dwivedi, Hemant J. Purohit, **Khardenavis AA**, Optimization of culture medium for enhanced production of β -fructofuranosidase by Response Surface Methodology. 8-10 Oct. 2017, International Conference on "Emerging Trends in Biotechnology for Waste Conversion (ETBWC – 2017)" XIV Annual Convention of Biotech Research Society India, CSIR-NEERI, Page no. 226.
5. Madhuri Gulhane, Prabhakar Pandit, **Khardenavis AA**, Hemant J. Purohit, Bio-process tuning in key steps of methane production: a study with anaerobic baffled reactor using vegetable waste as a model. 8-10 Oct. 2017, International Conference on "Emerging Trends in Biotechnology for Waste Conversion (ETBWC – 2017)" XIV Annual Convention of Biotech Research Society India, CSIR-NEERI, Page no. 395.
6. Priya Fuke, **Khardenavis AA**, Hemant J. Purohit, Process development for keratinous waste valorisation using *Serratia marcescens* EGD-HP20. 8-10 Oct.

2017, International Conference on “Emerging Trends in Biotechnology for Waste Conversion (ETBWC – 2017)” XIV Annual Convention of Biotech Research Society India, CSIR-NEERI, Page no. 396.

7. **Khardenavis, AA**, Energy from organic waste from small communities: Food waste biogas plant at Go-Vigyan Anusandhan Kendra, Deolapar, Nagpur. 20-22 Nov. 2017, UOP-NTU NEWRI Environment & Community Symposium, University of Peradeniya, Kandy, Sri Lanka.
8. Madhuri Gulhane, Prabhakar Pandit, **Khardenavis AA**, Hemant J. Purohit, Study of vegetable waste specific colonization of microbial community for biomethanation. 24-27 Nov. 2016, 57th Annual Conference of Association of Microbiologists of India (AMI2016) & International Symposium on Microbes and Biosphere, Gauhati University, Assam, Pg 124.
9. Vaibhav V Gujar, Hemant J. Purohit, **Khardenavis AA**, Fermentative production of fungal fructosyltransferase. 24-27 Nov. 2016, 57th Annual Conference of Association of Microbiologists of India (AMI2016) & International Symposium on Microbes and Biosphere, Gauhati University, Assam, Pg 278.
10. Priya Fuke, **Khardenavis AA**, Hemant J. Purohit, Draft genome sequence of *Serratia marcescens* EGD-HP20 strain harbouring feather degrading and nitrogen metabolism potential. 24-27 Nov. 2016, 57th Annual Conference of Association of Microbiologists of India (AMI2016) & International Symposium on Microbes and Biosphere, Gauhati University, Assam, Pg 339.
11. Madhuri Gulhane, Prabhakar Pandit, **Khardenavis AA**, Hemant J. Purohit, Optimization of performance efficiency of anaerobic baffled reactor for digestion of vegetable waste. 8-10 Dec. 2016, International Conference on Current Trends in Biotechnology ICCB-2016, VIT University, Vellore.
12. Priya Fuke, **Khardenavis AA**, Hemant J. Purohit, Management of melanized keratinous waste through keratin hydrolyzing enzyme from *Serratia marcescens* EGD-HP20. 22-25 Nov. 2015, 12th BRSI Convention & international conference on New Horizons in Biotechnology 2015(NHBT-2015). NIIST, Thiruvananthapuram.
13. Sneha Karia, Madhuri Gulhane, Parinita Sharma, **Khardenavis AA**, Hemant J. Purohit, Optimization of process parameters for biomethanation of vegetable waste using anaerobic baffled reactor. 22-25 Nov. 2015, 12th BRSI Convention & international conference on New Horizons in Biotechnology 2015 (NHBT-2015), NIIST, Thiruvananthapuram.
14. Prabhakar Pandit, Madhuri Gulhane, **Khardenavis AA**, Hemant J. Purohit, Bioaugmentation studies with hydrolytic bacteria for increasing biomethanation efficiency. 6-9 Nov. 2014, 11th BRSI Convention & International Conference on Emerging Trends in Biotechnology (BRSI-2014), JNU, New Delhi.
15. Parinita Sharma, **Khardenavis AA**, Hemant J. Purohit, Studies on consortia for hydrolysis of Long Chain Fatty Acids (LCFAs) for enhanced biomethane production. 6-9 Nov. 2014, 11th BRSI Convention & International Conference on Emerging Trends in Biotechnology (BRSI-2014), JNU, New Delhi.

16. Madhuri Gulhane, Prabhakar Pandit, **Khardenavis AA**, Hemant J. Purohit, Comparative analysis of hydrolytic bacterial diversity across multi chambered baffled reactor treating vegetable waste. 6-9 Nov. 2014, 11th BRSI Convention & International Conference on Emerging Trends in Biotechnology (BRSI-2014), JNU, New Delhi.
17. Priya Fuke, Hemant J. Purohit, **Khardenavis AA**, Optimization of fermentation conditions for keratin hydrolyzing enzyme by *Serratia marcescens* EGD-HP20 for poultry feather hydrolysis. 6-9 Nov. 2014, 11th BRSI Convention & International Conference on Emerging Trends in Biotechnology (BRSI-2014), JNU, New Delhi.
18. Gulhane M, Pandit P, **Khardenavis AA**, Purohit HJ, To study the biomethane potential of vegetable waste, X Convention of Biotech Research Society of India (BRSI-2013) International conference on Advances in Biotechnology and Bioinformatics (ICABB-2013), DY Patil Vidyapeeth, Pune, November 24-26, 2013.
19. Pandit P, Gulhane M, **Khardenavis AA**, Purohit HJ, Influence of microbial community in biogas production- Metagenomic Perspective, 54th Annual Conference of Association of Microbiologists of India (AMI-2013), Maharshi Dayanand University, Rohtak, November 17-20, 2013.
20. **Khardenavis AA**, Gedam N, Rao, NN, Purohit, HJ, Disinfection using some metal oxides and red mud, 1st International Bauxite, Alumina and Aluminium Society Symposium (IBAAS), JNARDDC, Nagpur, 3-5 Dec. 2012.
21. Pandit P, Thaore P, **Khardenavis AA**, Purohit HJ, Analysis of biomethane potential of vegetable waste. IX convention of Biotech Research Society of India (BRSI-2012) International Conference on Industrial Biotechnology (ICIB-2012), Panjabi University, Patiala, November 21-23, 2012.
22. Pal R, **Khardenavis AA**, Purohit HJ, Evaluation of bacterial culture HPC 1503 for heterotrophic nitrification and aerobic denitrification activity. IX convention of Biotech Research Society of India (BRSI-2012) International Conference on Industrial Biotechnology (ICIB-2012), Panjabi University, Patiala, November 21-23, 2012.
23. **Khardenavis AA**, Chakrabarti T, Purohit HJ, Conversion of agro-industrial wastewater into biodegradable plastic polybetahydroxybutyrate. Sri Lanka-India conference on Agro-Biotechnology for Sustainable Development, BMICH, Colombo, Sri Lanka, March 12-13, 2012.
24. **Khardenavis AA**, Wang J-Y, Energy from organic waste from small communities. Lien Foundation-NTU Environmental Endeavour (EE2) Seminar 2011, SIWW 2011, Suntec International Convention & Exhibition Centre, Singapore, July 6, 2011.
25. Pal R, **Khardenavis AA**, Purohit HJ, Study of simultaneous nitrification and denitrification phenomenon in *Diaphorobacter*. 51st Annual Conference of Association of Microbiologists of India (AMI-2010), BITS, Ranchi, December 14-17, 2010.
26. **Khardenavis AA**, Purohit HJ, Dibenzofuran mediated improved performance of activated sludge for treatment of distillery spentwash. Indo-Swedish International

Conference on Biotechnology for Sustainable Development, NCL, Pune, January 7-9, 2008.

27. **Khardenavis AA**, Kapley A, Purohit HJ, Characterization of bacteria with potential for simultaneous nitrification and denitrification. 76th Annual Meeting of SBCI, Sri Venkateshwara University, Tirupati, November 25-27, 2007.
28. **Khardenavis AA**, Purohit HJ, Metagenome: An abstract document of biogeochemical processes. 76th Annual Meeting of SBCI, Sri Venkateshwara University, Tirupati, November 25-27, 2007.
29. **Khardenavis AA**, Purohit HJ, Stabilization of upflow anaerobic reactor for dechlorination of substituted chlorophenols. Proceedings of 8th AANESWM, Anna University, Chennai, pp 227-234, December 10-13, 2006.