

KISHORE GOPALAKRISHNAN, Ph.D.

Research Scientist,

Wayne State University

5050 Anthony Wayne Dr. #2161, Detroit, MI, U.S.A - 48202

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RESEARCH EXPERIENCE

Research Scientist

Aug 2020 – **present**

Department of Biological Sciences (Ecotoxicology Lab)

Wayne State University, USA

Advisor: Dr. Donna Kashian

Projects:

- Isolation, identification, and characterization of novel cyanotoxins (microcystin) produced by cyanobacteria that limit the spawning of quagga (Dreissenid) mussels – Phase II
- Identifying how aquatic pollutants microplastics influence cyanobacteria and evaluating their physiological and biochemical changes in cyanobacteria and green algae.

Postdoctoral Fellow

Nov 2017 – Jul 2020

Department of Biological Sciences

Wayne State University, Detroit, MI. USA

Advisor: Dr. Donna Kashian

Projects:

- Isolation, identification, and characterization of novel cyanotoxins (microcystin) produced by cyanobacteria that limit the spawning of quagga (Dreissenid) mussels – Phase I
- Investigating the influence of calcium and temperature on quagga mussel's invasion

Postdoctoral Fellow

Feb 2016 – Oct 2017

Civil and Environmental Engineering

Wayne State University, USA

Advisor: Dr. Yongli Zhang

Projects:

- Optimization of culture conditions for the synthesis of microalgal secondary metabolites, lipids, and fatty acids.
- Conducted Spatial Life Cycle Assessment of Algal Bioenergy with Wastewater

Undergraduate Researcher

Oct 2005 – Mar 2006

SPIC Pharmaceuticals

India

Advisor: Dr. Ravi Chandran

Project:

- Optimization of sterilization time, media composition and precursor concentration for increased penicillin production by *Penicillium chrysogenum*.
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EDUCATION

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|---------------|---|------------|
| Ph.D | University of Canterbury, New Zealand | July 2015 |
| | Chemical and Process Engineering (Specialization: Bioprocess Engineering) | |
| | <u>Advisors:</u> Dr. Gabriel Visnovsky & Dr. Phil Novis | |
| | <u>Thesis:</u> Production of industrially important secondary metabolites from New Zealand alpine algae in airlift photo-bioreactor | |
| M.Tech | Annamalai University, India | May 2008 |
| | <u>Specialization:</u> Industrial Biotechnology | |
| | First class with distinction | |
| B.Tech | Anna University, India | April 2006 |
| | <u>Specialization:</u> Industrial Biotechnology | |
| | First class | |
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EXPERIENCE IN ANALYTICAL TECHNIQUES

- Cyanobacterial cultivation, extraction, and characterization
 - Flow cytometer analysis – BD Accuri C6
 - Experimental design - DOE-RSM – Design expert
 - Chromatographic techniques -Mass spectrometry
 - Total organic carbon analysis – TOC analyzer.
 - Optimization of fermentation parameters of industrially important products and scaling up for large scale production
 - Optimization of cultivation conditions
 - Dreissenid mussels spawning assay.
 - Dreissenid mussel culture maintenance
 - Maintenance of cancer cell lines and running FLIPR assay
 - Molecular Biology techniques – PCR, Gel electrophoresis and Blotting techniques
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TEACHING EXPERIENCE

Lecturer	Fermentation Technology, Bioprocess Engineering Department of Industrial biotechnology Rajalakshmi Engineering college, India	Jun 2008 – Dec 2010
Tutor	Bioreactor Lab Chemical and Process Engineering University of Canterbury, New Zealand	Jan 2012 – Dec 2014

HONORS AND AWARDS

Awarded Prestigious Doctoral Scholarship	2011 to 2014
<ul style="list-style-type: none">(20,000 NZ\$/year) by University of Canterbury	
Early Career Travel Grant	Dec 2018
<ul style="list-style-type: none">ASLO 2019 Aquatic Science Meeting – Puerto Rico	

FUNDING

The proposal submitted to Anderson Engineering Ventures Institute on the title "High value pigment production from newly discovered algae *Ettlia* species from New Zealand" has been selected for final round of \$5000 funding (Sep 9, 2016).

PUBLICATIONS

- Zhang Y, Diehl A, Lewandowski A, **Gopalakrishnan K**, Baker T. Removal efficiency of micro- and nanoplastics (180 nm–125 µm) during drinking water treatment. *Science of Total Environment*, 2020; 720: 137383
- Gopalakrishnan K K**, Kashian D R. Identification of optimal calcium and temperature conditions for quagga mussel filtration rates as a potential predictor of invasion. *Environmental toxicology and chemistry*, 2020, 39(2): 410-418
- Pedersen A F, **Gopalakrishnan K**, Boegehold A G, Peraino N J, Westrick J A, Kashian D R. Microplastic ingestion by quagga mussels, *Dreissena bugensis*, and its effects on physiological processes. 2020; *Environmental Pollution*, 260: 113964
- Gopalakrishnan K**, Roostaei J, Zhang Y. Mixed culture of *Chlorella* sp. and wastewater wild algae for enhanced biomass and lipid accumulation in artificial wastewater medium. *Frontiers of Environmental Science & Engineering*. 2018;12(4):14.

5. Roostaei J, Zhang Y, **Gopalakrishnan K**, Ochocki AJ. Mixotrophic Microalgae Biofilm: A Novel Algae Cultivation Strategy for Improved Productivity and Cost-efficiency of Biofuel Feedstock Production. *Scientific reports*. 2018; 8(1):12528.
6. Mazumdar N, **Gopalakrishnan KK**, Visnovsky G, Novis PM. A novel alpine species of Haematococcus (Chlamydomonadales: Chlorophyta) from New Zealand. *New Zealand Journal of Botany*. 2018; 56(2):216-26
7. **Gopalakrishnan, K**, Novis, P, Visnovsky, G. Alpine Scenedesmaceae from New Zealand: new taxonomy. *New Zealand Journal of Botany*. 2014; 1-16.
8. Novis, P. M, Smissen, R, Buckley, T. R, **Gopalakrishnan, K**, Visnovsky, G. Inclusion of chloroplast genes that have undergone expansion misleads phylogenetic reconstruction in the Chlorophyta. *American journal of botany*. 2013; 100:2194-209.
9. **Gopalakrishnan, K. K.** & Detchanamurthy, S.. Effect of Media Sterilization Time on Penicillin G Production and Precursor Utilization in Batch Fermentation. *J Bioprocess Biotechniq*. 2011; 1:5.
10. **K Gopalakrishnan**, Jenila Rani. D, Karthick Raj. K, Uma. A. Production of biofilm vaccine for *Aeromonas hydrophila* and studying its efficacy in a fish model. *International Journal of Applied Engineering Research*. 2015; 10 (13):11801-07.

MANUSCRIPT UNDER REVIEW

1. Complex interactions among temperature, microplastics and cyanobacteria may facilitate cyanobacterial proliferation and microplastics deposition – Submitted to Journal "*Ecotoxicology and Environmental Safety*" – First author
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CONFERENCE /SEMINAR PRESENTATIONS

1. **Gopalakrishnan, K.** Kashian, D. (2022) Microplastics can facilitate cyanobacterial blooms which can promote their deposition. Grand Rapids, Michigan, JASM 2022 (Conference contribution – Oral presentations)
2. Kashian, D. **Gopalakrishnan, K.** (2022) Increase in temperature trigger seasonal shifts in Quagga mussel spawning in the Detroit River. Grand Rapids, Michigan, JASM 2022 (Conference contribution – Oral presentations)
3. Kashian, D. Boegehold, A. **Gopalakrishnan, K.** Pedersen, A. (2019) Ingestion of microplastics can inhibit filtration rates in quagga mussels (*Dreissena bugensis*). Salt Lake City, Utah. Society of Freshwater Sciences, May 19-23, 2019. (Conference contribution – Oral presentations)

4. **Gopalakrishnan, K.** Pedersen, A, Kashian, D. (2019) Effect of temperature and calcium on Quagga Mussels' filtration rates. San Juan, Puerto Rico, ASLO 2019 Aquatic meeting, February 26, 2019 (Conference contribution – Oral Presentation)
 5. Kashian, D. Boegehold, A. **Gopalakrishnan, K.** Johnson, N. (2019) Can harmful algal blooms inhibit quagga mussel reproduction? San Juan, Puerto Rico, ASLO 2019 Aquatic meeting, February 26, 2019 (Conference contribution – Oral Presentation)
 6. Pedersen, A. Boegehold, A. **Gopalakrishnan, K.** Kashian. D. (2019) Sublethal effect in *Dreissena bugensis* following exposure to microplastics. San Juan, Puerto Rico, ASLO 2019 Aquatic meeting, February 26, 2019 (Conference contribution – Oral Presentation)
 7. **Gopalakrishnan, K.** Kashian, D, Boegehold, A, Johnson, N (2019) Effect of cyanobacteria on quagga mussels (*Dreissena rostriformis bugensis*) reproduction. Cleveland, Ohio, Midwest fish and wildlife conference, January 29, 2019 (Conference contribution – Oral presentations)
 8. Zhang, Y. Veltri, V. **Gopalakrishnan, K.** Roostaei, J. (2017) Occurrence and fate of chemicals of emerging concern (CECs) and their interactions with microbiota in urban water cycles. Philadelphia: NIEHS 2017 Superfund Research Program Annual Meeting, December 6, 2017 (Conference Contributions - Poster presentations)
 9. **Gopalakrishnan, K.** Roostaei, J. and Zhang, Y. (2017) Optimization of wastewater treatment efficiency and biofuel productivity by chlorella species and mixed wastewater algae using response surface methodology (RSM). Ann Arbor, Michigan: AEEP Conference, June 22, 2017 (Conference Contributions - Poster presentations)
 10. **Gopalakrishnan, K.** Roostaei, J. and Zhang, Y. (2017) Optimization of effective parameters for maximum production of biomass and lipids by chlorella and MWWA by Box-Behnken model developed using DoE-RSM. Ann Arbor, Michigan: Borchardt Conference, February 22, 2017 (Conference Contributions - Poster presentations)
 11. **Gopalakrishnan, K.** and Visnovsky, G. (2014) Influence of light intensity on growth kinetics and PUFA's production of New Zealand alpine algae cultivated in airlift photobioreactors. Wellington, New Zealand: New Zealand Microbiological Society Conference 2014, November 18-20, 2014. (Conference Contributions - Poster presentations)
 12. **Gopalakrishnan, K.**, Visnovsky, G. and Novis, K. (2012) *Pigments and lipids from NZ alpine algae*. Dunedin, New Zealand: Forum on Algal and Cyanobacterial Biomass, Bioenergy and Bioproducts, December 7, 2012. (Conference Contributions - Oral presentations)
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ADDITIONAL TRAINING

Teacher and personality development National Institute of Technical Teachers' Training and Research - India	Dec 2008
National training program on Enzyme Technology Annamalai University – India	Mar 2010
Implant training Central Leather Research Institute - India	Dec 2004

REFERENCES

Dr. Donna Kashian

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Department of Biological Sciences,
Wayne State University,
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Dr. Yongli Zhang

Assistant professor,
Department of Civil and Environmental Engineering
Wayne State University
5050 Anthony Wayne Dr. #2168, Detroit, MI, U.S.A 48202
Phone: 313-577-9962, Email: zhangyl@wayne.edu

Dr. Phil Novis

Researcher – Phycologist
Landcare Research Ltd.
Lincoln 7640, New Zealand
Phone : +64 3 321 9998, E-Mail: NovisP@landcareresearch.co.nz

DECLARATION

I hereby declare that the information furnished above is true to the best of my knowledge. I am ready to furnish further details on request.

Date: Mar 15, 2023.

Place: Detroit, USA

Kishore Gopalakrishnan
