CURRICULUM VITAE

Dr. S. KATHIRESAN, M.Sc.(Agri), Ph.D.,
Associate Professor
Department of Biotechnology,
School of Life Sciences,
Central University of Tamil Nadu
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Scopus *- https://www.scopus.com/authid/detail.uri?authorId=15843840600*
Google Scholar *- https://scholar.google.com/citations?user=Lkq7OYAAAAAJ&hl=en*

Education

Ph.D in Biotechnology, Central Food Technological Research Institute, Mysore, Karnataka, India.

M.Sc. (Agri) - Plant Pathology, University of Agricultural Sciences, GKVK campus, Bangalore, Karnataka, India.

B.Sc (Agri) - Tamilnadu Agricultural University, Coimbatore, Tamilnadu, India.

Research Area:

- **Plant Genomics and Metabolic Regulation –** Regulates the genes involved in primary and secondary metabolic pathways through gene cloning, construction and transformation. Also environmental and nutrient stress physiology to regulate the omega 3/6 fatty acids in plants and microalgae
- **Genetic Engineering in Crop Plants** – Specific to High Value Polyunsaturated Fatty acid (HVPUFA) and Carotenoid biosynthetic pathway in Plants, Microalgae and *E.coli*. *Agrobacterium* mediated in plants and microalgae for high value metabolite production.

Teaching Area:

Plant Biotechnology, Plant Genomics,
Genetic Engineering & Recombinant DNA Technology,
Plant Physiology & Biochemistry,
Plant Pathology, Economic Botany,
Microalgal Biotechnology.

Honors /Award:

- Early Career Research Award from SERB, Govt of India, New Delhi - 2018
- Young Scientist Award from SERB, Govt of India, New Delhi – 2012
- Post Doctoral Fellow UGC, New Delhi - 2010
- Received International Travel award from DST, India - 2008
- Awarded ASRB - NET in Plant Pathology – 2004 & 2009
- Awarded CSIR- JRF and NET in Life Sciences - June 2003
- Awarded ICAR – JRF in Plant Sciences – 2001

Work Experience:

2020 - Till Date - Associate Professor, Department of Life Sciences, Central University of Tamil Nadu, Thiruvarur, Tamilnadu.

2019-2020 - Assistant Professor (Selection Scale) Dept of Molecular Biology, School of Biological Sciences, Madurai Kamaraj University, Madurai, Tamil Nadu

2014-2019 - Assistant Professor (Senior Scale) Dept of Molecular Biology, School of Biological Sciences, Madurai Kamaraj University, Madurai, Tamil Nadu

2010-2014 **-** Assistant Professor, Department of Molecular Biology, School of Biological Sciences, Madurai Kamaraj University, Madurai, Tamil Nadu

2010 - Research Associate, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu

2009 **-** Guest Lecturer, Department of Biotechnology, Bharathidasan University, Trichy, Tamil Nadu

Academic Experience:

2022-Till Date – Member, BoS for iM.Sc Biotechnology, CUTN, Thiruvarur

2022-Till Date - External Expert for the BoS in Biotechnology, Periyar University, Salem

2022- Till Date – External Expert for the BoS in Biotechnology, Rathinam College of Arts and Science, Coimbatore

2021 – Member for the SATHI (Sophisticated Analytical and Technical Help Institutes) proposal, CUTN

2021 – Co-coordinator, DST PURSE for the Life Science group (Theme: Health Science)

2021-2022 – Member - to prepare documents (Criteria III) for NAAC Accreditation at CUTN.

2021-Till date - Member, NAAC for the Department of Biotechnology, Central University of Tamil Nadu

2018-2020 – Member, Board of Studies in Botany, SVN College, Nagamalai Pudukkottai, Madurai

2016-2020 – Member, Board of Studies in Microbiology (PG), Department of Microbial Technology, Madurai Kamaraj University, Madurai

2017-2019 – University Nominee, Board of Studies in Zoology, ANJA College, Sivakasi

Administrative Experience:

2022-Till date – Member, Dr.Ambedkar Centre of Excellence (DACE), CUTN, Thiruvarur

2021 – Till date Member for the purchase of various equipment from SERB projects and other purchase/tender process at CUTN, Thiruvarur.

2017-2018 - Member, University with Potential for Excellence (UPE), Kamaraj University, Madurai

2017-2018 – Member, NIRF, Madurai Kamaraj University, Madurai

2010-2011 – Member for Campus Development in the University with Potential for Excellence, Madurai Kamaraj University, Madurai

Research Achievements:

- Identified and characterized the PUFA specific genes (*Δ5Des, Δ6Des* and *Δ6Elo)* from marine microalgae.
- Isolated and cloned the *Δ5Des, Δ6Des* and *Δ6Elo* genes from marine microalgae and functionally characterized by expressing them in *E.coli.*
- Genetically engineered the model plant *Arabidopsis thaliana* and oilseed plants such as Soybean and Sesamum using these genes and regulated lipid biosynthetic pathway for HVPUFA production.
- First described the *Agrobacterium* mediated genetic transformation in freshwater green microalga – *Haematococcus pluvialis* and isolated and cloned the carotenoid specific gene *BKT* (Beta carotene ketolase) and transformed to green alga *H. pluvialis* for regulated the carotenoid biosynthetic pathway and successfully enhanced the production of a ketocarotenoid - Astaxanthin.
- Evaluated and confirmed the administration of PUFA enriched microalgal biomass (*Isochrysis* sp) to the animal model (Wistar rats) there by recommendation of microalgal biomass supplementation to elevate the eicosapentaenoicacid (EPA) and docosahexaenoicacid (DHA) level in brain and other major organs.

Research Projects:

Sl. No	Title of Research Project	Funding Agency	Period	PI/Co-PI	Amount
	Externally Funded				
1	Influence OF *Δ6Des* and *Δ6Elo* Genes ON Omega3/6 Fatty Acid Biosynthesis IN Groundnut – A Genetic Engineering Approach	SERB, Govt. of India	2023 - 2026	PI	**43.74 Lakhs**
2	Pathway Extension of Essential Fattyacid Biosynthesis in Soybean for High Value PUFA Production by Genetic Transformation of Microalgal Genes	SERB, Govt. of India	2021 to 2024	PI	**48.8 Lakhs**
3	Engineering Fatty Acid Pathway Genes in *Kluyveromyces Marxianus* Yeast to Synthesize the Long Chain Polyunsaturated Fatty Acids	SERB, Govt. of India	2023-2025	Mentor	**20.25 Lakhs**
4	Metabolic Regulation of PUFA Biosynthesis in Soybean using Microalgal Desaturase and Elongase Genes	SERB	2016-2018	PI	**11.0 Lakhs**
5	Lipid Modification in Oilseed crop using *Δ6Des* and *Δ5Des* from Microalgae: A Focus towards Omega 3/6 Fatty acid Production	SERB	2018 - 2022	PI	**34.3 Lakhs**
6	Green Energy from Oleaginous Cyanobacteria: Production, Optimization and over expression of acetyl CoA carboxlyse and Thioesterase for Biodiesel production	CSIR	2013-2016	Co-PI	**10.6 Lakhs**
7	Exploration of micro algal genes for the production of high value polyunsaturated fatty acids in plants	UGC	2013-2016	PI	**14.2 Lakhs**
8	Studies on Expression Levels of Essential Fatty acid Biosynthetic Genes in Micro Algae	SERB	2012-2015	PI	**22.9 Lakhs**
	Internally Funded				
9	Identifying the Production Potential of High Value Polyunsaturated Fatty acids (PUFAs) from Microalgae for the Therapeutic Applications	DBT-IPLS, MKU	2014-2017	PI	**6.5 Lakhs**
10	Metabolic Engineering of *Escherichia coli* for High Value Polyunsaturated Fattyacid (HVPUFA) Production using Microalgal Desaturase and Elongase genes	DST-PURSE, MKU	2013-2016	PI	**2.6 Lakhs**
11	Studies on Expression profiles of High Value PUFA genes in developing seeds of selected underutilized oilseed crops	UGC-CAS, MKU	2014-2017	PI	**0.85 Lakhs**
12		UGC-NRCBS, MKU	2014	PI	**5.0 Lakhs**

Papers Published

- Ram Kumar M, Gayathri S, Thangavel K, Jeyakumar B, Ganesh D and **Kathiresan S* (2023).** Combined supplementation of 2, 4-D and Kinetin Elevates Callus Induction from Cotyledon Segments of Different Soybean Cultivars (Glycine max (L.) Merril]. ***Plant Archives,*** 24
- Priyadarsini L, A. Subbiah A, Srivignesh S, Rama Krishna K, Rajaram K, **Kathiresan S** and Ramesh Kumar A **(2023).** Comparative analysis of growth and yield parameters of grape var. 'Muscat Hamburg' grafted on 'Dog Ridge' rootstock and self-rooted cuttings ***Plant Archives***, 23: 884-888.
- Jeyakumar B, Bhalram K, Thiyagarajan S, Parthasarathy A, Ramkumar M, Vellaikumar S, Arumugam M, Sugasini D, **Kathiresan S* (2022).** Maternal supplementation of high-value PUFA-Rich Isochrysis sp. biomass prevents monosodium glutamate-induced neurotoxicity in first-generation Wistar rats ***Neurochemistry International*** **–** 105292 **(IF 4.2)** https://doi.org/10.1016/j.neuint.2022.105292
- Ram Kumar M, Thiyagarajan S, Parthasarathy A, Govendan S, Dinesh Babu KS, Gopal P, Babu Rajendra Prasad V, **Kathiresan S* (2022).** Extending Omega 3/6 Fatty Acid Pathway in Arabidopsis thaliana using Microalgal Gene Δ6Des for Stearidonic acid and Dihomo-γ-linolenic acid Production. ***South African Journal of Botany*** **(IF 3.1)** https://doi.org/10.1016/j.sajb.2021.12.035
- Parthasarathy A, Arumugam M, **Kathiresan S* (2022).** Iron and methyl jasmonate increase high-value PUFA production by elevating the expression of desaturase genes in marine microalga *Isochrysis* sp. ***Journal of Applied Microbiology***. 132:3, 2042-2053. https://doi.org/10.1111/jam.153 56 **(IF-4.1)**
- Muthu Ram K, Abhishek Kumar, Baburajendra Prasad V, **Kathiresan S* (2021).** IAA combine with kinetin elevates the α-linolenic acid in callus tissues of soybean by stimulating the expression of FAD3 gene ***Plant Gene*** **28** :100336
- Anila N, Daris S, **Kathiresan S,** Sarada R, Ranga Rao A, Ravishankar G.A **(2021).** Metabolic engineering of astaxanthin pathway and heterologous production in novel organisms Global Perspectives on Astaxanthin From Industrial Production to Food, Health, and Pharmaceutical Applications 2021, Pages 151-179
- Jeyakumar B, Prakash G, Suganya K, Murugan M and **Kathiresan S* (2021).** Anti-listerial Activity of Microalgal Fatty Acid Methyl Esters and Their Possible Applications as Chicken Marinade. Accepted in ***International Journal of Food Microbiology***. **(IF-5.4)**
- Thiyagarajan S, Priyal K., Arumugam M, Vellaikumar S and **Kathiresan S* (2020).** Heterologous production of polyunsaturated fatty acids in *E. coli* using Δ5-desaturase gene from microalga *Isochrysis* sp. ***Applied Biochemistry and Biotechnology.*** https://doi.org/10.1007/s12010-020-03460-1 **(3.0)**
- Jeyakumar B, & **Kathiresan S* (2020).** Lowering the Culture Medium Temperature Improves the Omega-3 Fatty Acid Production in Marine Microalga Isochrysis sp.

CASA CC 101. ***Preparative Biochemistry & Biotechnology.*** https://doi.org/10.1080/10826068.2020.1833345 **(IF- 2.9)**

- Jeyakumar B, Asha D, Varalakshmi P, **Kathiresan S*** **(2020).** Nitrogen repletion favors cellular metabolism and improves eicosapentaenoic acid production in the marine microalga *Isochrysis* sp. CASA CC 101 ***Algal Research*.** 47:101877 https://doi.org/10.1016/j.algal.2020.101877 **(IF- 5.1)**
- Thiyagarajan S Arumugam M, **Kathiresan S.*** **(2019)** Identification and Functional Characterization of Two Novel Fatty acid Genes from Marine Microalgae for Eicosapentaenoic acid Production. ***Applied Biochemistry and Biotechnology*.** 190:1371–1384 **(3.0)**
- Sugasini D, Kasthuri T, Prasanth K, **Kathiresan S**, Chidamabaranathan N, Kavitha B, Prabakaran K and Kanchana S **(2019)**. Hypolipidemic and anti-atherogenic effect of omega-3 enriched structured lipids from linseed oil (LSO) with refined palm olein oil (RPOO) on rats fed atherogenic diet. ***The FASEB Journal*** 33(S1):796.2 **(IF-5.8)**
- Lakshmana Senthil S, Suja CP, Anantharaman P, Kannan K and **Kathiresan S (2019)**. First record of *Coelastrella vacuolata* (Chlorophyta: Scenedesmaceae) in Tuticorin coast, Gulf of Mannar. ***Indian Journal of Geo Marine Sciences***. 48:1860-1863 **(IF-0.6)**
- Jeyakumar B, Sugasini D, Selvam GS, Arumugam M, Vellaikumar S, Ramalingam J and **Kathiresan S*** (2019) Omega-3-rich *Isochrysis* sp. biomass enhances brain docosahexaenoic acid levels and improves serum lipid profile and antioxidant status in Wistar rats. ***Journal of the Science of Food and Agriculture***. 99: 6066–6075 **(IF-4.1)**
- Maria Joseph Angelaalincy, Rathinam Navanietha Krishnaraj, Ganeshan Shakambari, **Shanmugam Kathiresan**, Balasubramaniem Ashokkumar and Perumal Varalakshmi (2018). Biofilm Engineering Approaches for Improving the Performance of Microbial Fuel Cells and Bioelectrochemical systems. ***Frontiers in Energy Research*.** 6:1-12 **(IF-3.8)**
- Thiyagarajan S, Arumugam M, Senthil N, Vellaikumar S, **Kathiresan S*** **(2018).** Functional characterization and substrate specificity analysis of Δ6-Desaturase from marine microalga *Isochrysis* sp CASA CC101. ***Biotechnology Letters*.** 40:577–584 **(IF-2.7)**
- Aswathy Udayan, **Kathiresan Shanmugam** Muthu Arumugam **(2018).** Kinetin and Gibberellic acid (GA3) act synergistically to produce high value polyunsaturated fatty acids in *Nannochloropsis oceanica* CASA CC201. ***Algal Research.*** 32: 182–192 **(IF-5.1)**
- Kasthuri TR, **Kathiresan S*,** Jeyakumar B, Kanchana S, Sugasini D, Hemalatha G, Chidambaranathan N, Murugan M, Prabakaran K **(2017).** Hypolipidemic Effect of Alpha-Linolenic Acid Rich Blended and Interesterified of Refined Palm Olein Oil With Flaxseed Oil as Compared to Native Oil Fed Rats. ***SM Liver Journal.*** **2(1): 1005**

- Abhishek, T. Vidhi, P. Eldho, G. Divya, A. Mahesh, K. Ritu, P. Sasikumar, **S. Kathiresan,** S. Luciano and G.S. Selvam **(2017).** Expression of heterologous oxalate decarboxylase in HEK293 cells confers protection against oxalate induced oxidative stress as a therapeutic approach for calcium oxalate stone disease. ***Journal of Enzyme Inhibition Medicinal Chemistry*.** 32(1):426–433 **(IF-5.7)**
- K. Jawaharraj, R. Karpagam, B. Ashokkumar, **S. Kathiresan**, I. Ganeshmoorthy, M. Arumugam and P. Varalakshmi **(2017).** Improved biomass and lipid production in Synechocystis sp. NN using industrial wastes and nano-catalyst coupled transesterification for biodiesel production. ***Bioresource Technology*** 242: 128–132 **(IF-11.4)**
- **Kathiresan S. (2017)** Towards Commercial Production of High Value Polyunsaturated Fattyacids in *E. coli* using Novel Genes from Microalgae in Proceedings of the National Conference on Biodiversity, Biology and Biotechnology of Algae at CAS in Botany, University of Madras, Chennai
- M. D. Kavitha, **S. Kathiresan,** Sila Bhattacharya and R. Sarada **(2016).** Culture media optimization of *Porphyridium purpureum*: production potential of biomass, total lipids, arachidonic, and eicosapentaenoic acid. ***Journal of Food Science and Technology***. 53 (5): 2270–2278 **(IF-3.1)**
- **S. Kathiresan**, Arun Chandrashekar, G.A. Ravishankar, R. Sarada **(2015)**. Regulation of astaxanthin and its intermediates through cloning andgenetic transformation of β-carotene ketolase in *Haematococcus pluvialis*. ***Journal of Biotechnology*** 196–197:33–41**(IF-4.1)**
- K. Jawaharraj, R. Karpagam, B. Ashokkumar, **S. Kathiresan** and P. Varalakshmi **(2015).** Green renewable energy production from Myxosarcina sp.: media optimization and assessment of biodiesel fuel properties. ***RSC Advances***. 5: 51149-51157**. (IF – 3.9)**
- **Kathiresan S. (2015)** Microalgal Biotechnology for Food and Health Applications in Proceeding of National Seminar on Conservation and sustainable utilization of Marine Resources at TDMNS College, T.Kallikulam, Tamil Nadu p7-4
- **Kathiresan S***. **(2014)** Recent Trends in Microalgal Biotechnology In Proceedings of the National Seminar on Algae for Sustainable Agricultural Production at AC & RI, TNAU, Madurai
- **Kathiresan, S.,** Sarada, R., Arun Chandrashekar and Ravishankar G.A **(2008).** *Agrobacterium* mediated transformation in green alga *Haematococcus pluvialis*. ***Journal of Phycology*** **(IF - 2.9)**
- **Kathiresan, S.** Sarada R. **(2008).** Towards genetic improvement of commercially important microalga *Haematococcus pluvialis* for biotech applications. ***Journal of Applied Phycology*** 21:**553-558 (Impact Factor – 3.3)**

- **Kathiresan S,** R. Sarada, Sila Bhattacharya and G.A. Ravishankar **(2007).** Culture media optimization for growth and phycoerythrin production from *Porphyridium purpureum* ***Biotechnology and Bioengineering*** 96: 456-463 **(IF – 4.4)**

Books Edited/Book Chapters

Arumugam M, **Kathiresan S,** Nagaraj S. **(2020)** Applied Algal Biotechnology. ***Nova Science Publisher***, New York, USA. ISBN 978- 1-53617-520-0

Sarada R. Anila N, **Katherisan S,** Ranga Rao A and Ravishanakar GA. **(2020)** Metabolic engineering of astaxanthin pathway and heterologous production in novel organisms In Global Perspectives on Astaxanthin: From Industrial Production to Food, Health, and Pharmaceutical Applications ***Elsevier*** **(Under Proof Editing)**

Jeyakumar B, Thiyagarajan S, **Kathiresan S*. (2020)** Marine-Microalgae as a Potential Reservoir of High Value Nutraceuticals In *Marine Niche: Applications in Pharmaceutical Sciences* Chapter 8, pp 221-236 (Neelam_et al Eds) Published by Springer Nature Singapore Pte Ltd. **ISBN** 978-981-15-5016-4; **ISBN** 978-981-15-5017-1 (eBook)

Kathiresan S*, Ramkumar M **(2020)** Genetic Transformation and Metabolic Engineering in Algae In ***Applied Algal Biotechnology*** Chapter 8, pp. 163-184 (Arumugam et al, Eds) Published by Nova Science Publisher, New York, USA.

Aswathy Udayan, Jeyakumar B, **Kathiresan S*,** Muthu Arumugam **(2020)** Nutraceuticals and Therapeutic Applications of Algae In ***Applied Algal Biotechnology*** Chapter 8, pp. 163-184 (Arumugam et al, Eds) Nova Science Publisher, New York, USA.

Kathiresan S*, Thyagarajan, S Jeyakumar B. (2019) Towards Commercial Production of High Value Polyunsaturated Fattyacids In ***ALGAE (Biodiversity, Biology and Biotechnology)***. Chapter 17 pp 251-260. (Nagaraj, S Ed) Published by Centre for Advanced Studies in Botany, University of Madras, Guindy Campus, Chennai - 600025, India

Kathiresan, S*. (2019) Advances in Microalgal Biotechnology: A Focus towards Genetic Transformation In ***ALGAE (Biodiversity, Biology and Biotechnology).*** Chapter 17 pp 261-267. Published by Centre for Advanced Studies in Botany, University of Madras, Guindy Campus, Chennai - 600025, India

Kathiresan, S*. (2015) Microalgal Biotechnology for Food and Health Applications In Proceeding of National Seminar on Conservation and sustainable utilization of Marine Resources at TDMNS College, T.Kallikulam, Tamil Nadu p7-4

Kathiresan S* (2013) Application of *in vitro* plant systems and nursery techniques. Published by Directorate of Distance Education, Madurai Kamaraj University, Madurai, Tamilnadu

Guidance for Ph.D/M.Phil/M.Sc Research

Level of Guidance	Title of the Thesis	Degree Award
Ph.D.		
S.Thiyagarajan	Molecular studies of High value Polyunsaturated Fatty acids Genes from Marine Microalgae	2018
B. Jeyakumar	Preliminary investigation of Microalgal Lipids and its Therapeutic Applications	2020
Dr. P. Illamathi (Co-Guide)	Conferring insect resistance in plants by employing Allium lectin gene and study of small non-coding RNAs involved in virulence of Agrobacterial strains	2021
M. Ramkumar	Metabolic Regulation of Fatty Acid Biosynthesis in Soybean [*Glycine max* (L.) Merrill] using HVPUFA Specific Genes from Marine Microalgae	2023
Parthasarathy	Regulation of fatty acid biosynthetic genes and associated changes in PUFA profile in marine microalgae *Isochrysis* sp under different culturing conditions	2023
B.Saranya DBT-JRF	Studies on Pathway Engineering in Groundnut (*Arachis hypogea)* using PUFA specific genes	Ongoing

Patents

S. Kathiresan, R. Sarada, Sila Bhattacharya and G.A.Ravishankar. An improved culture medium useful for enhancement of Phycobiliproteins in *Porphyridium* spp. **335/DEL/06.**

Workshop conducted:

Name of the Course	Place	Duration	Sponsoring Agency
33rd NRCBS Winter School on Differential Gene Expression in Plants and Bacteria	School of Biological Sciences, Madurai Kamaraj University, Madurai	01.02.2017 to 14.02.2014 (14 days)	UGC NRCBS -New Delhi

Member in Academia/ Societies/Reviewer/Editor/ Thesis Evaluation

- Life Member - Society for Plant Biochemistry and Biotechnology, IARI, New Delhi
- Life Member - Aqua - Terr Society for Biological Sciences, MKU, Madurai
- Book Editor - Frontier in Genetics
- Reviewer – Frontiers in Plant Science
- Reviewer – Algal Research
- Thesis Evaluation – Evaluated more than 10 Ph.D and 25 M.Sc Thesis