

Dr. Vidyashankar S., M.Sc., Ph.D.

Dept. of Biotechnology

CSIR-IHBT

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QUALIFICATION

Ph.D. in Biotechnology (CSIR-CFTRI) **Specialization in Algal Biotechnology**

Thesis: Studies on microalgae for lipid production and elucidation of stress related biochemical changes

Advisor: Dr. R. Sarada

Head, Plant Cell Biotechnology Dept.

CSIR-CFTRI

Mysore 570 020

Core Research Areas & Skills

- I. Microalgal pigments and lipids - Characterization and Downstream processing
- II. Plant and seed proteins – Bulk extraction and product development
- III. Formulation of functional foods with targeted applications
- IV. Food composition analysis
- V. Toxicity evaluation of phytochemicals and feed substances in experimental rats
- VI. Development of simple harvesting methods for algal biomass concentration

Industry Experience

February 2016 – September 2017

Worked as **Head R&D and Quality** at M/s. Sprout Life Foods Pvt. Ltd., Bangalore

Functional foods and High Protein food product development

Key Responsibilities

1. Formulation of 100% natural (preservatives/additives free) on the go Snack bars and High protein bars
2. Functional products development incorporating Spirulina/herbals/nutraceuticals
3. Quality control of processes for snack bars and High protein bars production

Achievements

1. Standardized formulations and executed the launch of Yogabar 20g protein bar
2. Contributed to the increase in shelf life of Yogabars from 2 months to 4 months
3. Contributed to the increased productivity in operations from 60000 bars/month (Mar 2016) to 2.5 lakhs bars/month (Mar 2017) in the role of Manager R&D/Quality

September 2015 – February 2016

Worked as Assistant Manager, R&D at M/s. Wellisen Nutraceuticals Pvt. Ltd., Mysore in the area of Microalgal biotechnology

Key Responsibilities

1. Spirulina production and productivity improvement
2. Natural color extraction from Spirulina biomass (C-Phycocyanin)
3. Development of non-toxic/biological harvesting methods for Spirulina biomass production
4. Rice bran protein extraction – Process development

Research Experience

Total 6 years of R&D in microalgal biotechnology focusing on microalgal lipids and nutraceuticals

Senior Research Fellow (2009 – 2015) at Dept. of Plant Cell Biotechnology, CSIR-CFTRI

- Team member in the establishment of Algal Culture Facility at CSIR-CFTRI
- Isolated and maintained a germplasm (live cultures) of microalgae cultures (freshwater and marine)
- Development of Low Density Polyethylene (LDPE) based photo bioreactor for CO₂ sequestration
- Development of biomass harvesting system and large scale lipid extraction and characterization
- Devised “**Organic claim**” harvesting systems using seed proteins from Drumstick, Tamarind mucilage

Member of project sponsored by Department of Biotechnology, Govt. of India (October 2011 – October 2014) at CFTRI:

Title: Development of bench-scale prototype reactor-extraction system for integrated CO₂ sequestration, Aquatic Microbial Oxygenic Photoautotrophs (AMOPs) cultivation and conversion to value added products (food & biofuel).

Key responsibilities:

1. Extraction of omega-3 fatty acid lipid fraction and solubilisation in cooking oils
2. Extraction and processing of microalgal carotenoids oleoresins for food colorant applications
3. Evaluation of defatted microalgal biomass as source of protein rich animal feed

Member of Grant-in-aid project sponsored by KDMIPE-ONGC, Dehradun at PCBT, CFTRI (October 2009- November 2012):

Title: Development of the process for mass cultivation of selected microalgae for hydrocarbon production.

Key responsibilities:

1. Development of process for large scale cultivation of microalgae
2. Development of methods for extraction and purification of microalgal hydrocarbons
3. Lipid/Hydrocarbons quality analysis

Major Research Publications

1. **S. Vidyashankar**, K. Deviprasad, V.S. Chauhan, G.A. Ravishankar, R. Sarada. Selection and evaluation of CO₂ tolerant indigenous microalga *Scenedesmus dimorphus* for unsaturated fatty acid rich lipid production under different culture conditions. *Bioresource Technology*, Elsevier, 2013, 144, 28-37 (Impact Factor – 4.49)
2. **S. Vidyashankar**, S. Krupanidhi. Elevated levels of saturated and unsaturated fatty acids highlight the nutritional value of *Ulva covalengensis*, a marine dietary alga found in South India. *Indian Journal of Geo-Marine Sciences* 2013, 42(1), 120-124. (Impact Factor – 0.294)

3. T. Sarat Chandra, G. Suvidha, S. Mukherji, V.S. Chauhan, **S. Vidyashankar**, K. Krishnamurthi, R. Sarada, S.N. Mudliar. Statistical optimization of thermal pretreatment conditions for enhanced biomethane production from defatted algal biomass. *Bioresource Technology*, Elsevier, 2014, 162, 157-165. (Impact Factor – 4.49)
4. **S. Vidyashankar**, K.S. VenuGopal, S.P. Muthukumar, V.S. Chauhan, R. Sarada. Characterization of defatted *Scenedesmus dimorphus* algal biomass as animal feed. *Journal of Applied Phycology*, Springer Publications, 2014, 27, 1871-1879 (Impact Factor – 2.55).
5. **S. Vidyashankar**, E. Sireesha, V.S. Chauhan, R. Sarada. Evaluation of microalgae as vegetarian source of dietary polyunsaturated fatty acids under autotrophic growth conditions. *Journal of Food Science and Technology*, Springer Publications, 2015, 52, 7070-7080 (Impact Factor – 2.02).
6. **S. Vidyashankar**, K.S. VenuGopal, G.V. Swarnalatha, M.D. Kavitha, V.S. Chauhan, R. Ravi, A.K. Bansal, Ranjith Singh, Anil Pande, G.A. Ravishankar, R. Sarada. Characterization of fatty acids and hydrocarbons of chlorophycean microalgae towards their use as biofuel source. *Biomass and Bioenergy*, Elsevier, 2015, 77: 1-17 (Impact Factor – 3.41).
7. T. Sarat Chandra, S.N. Mudliar, **S. Vidyashankar**, S. Mukherji, R. Sarada, K. Krishnamurthi, V.S. Chauhan. Defatted algal biomass as non-conventional low cost adsorbent: Surface characterization and methylene blue adsorption characteristics. *Bioresource Technology*, Elsevier, 2015, 184, 395-404. (Impact Factor – 4.49)
8. M.D. Kavitha, M.H. Seema Shree, **S. Vidyashankar**, R. Sarada. Acute and subchronic safety assessment of *Porphyridium purpureum* biomass in the rat model. *Journal of Applied Phycology*, Springer Publications, 2015, ACCEPTED DOI: 10.1007/s10811-015-0655-9 (Impact Factor – 2.55).

Book Chapters

1. G.A. Ravishankar, R. Sarada, **S. Vidyashankar**, K.S. VenuGopal, A. Kumudha. Cultivation of microalgae for lipids and hydrocarbons, and utilization of spent biomass for livestock feed and for bioactive constituents. In: *Biofuel coproducts as livestock feed opportunities and challenges* (Ed: H.P.S. Makkar). FAO. 2012, pp: 423-446.
2. **S. Vidyashankar**, G.A. Ravishankar. Algae-Based Bioremediation: Bioproducts and Biofuels for Biobusiness. In: *Bioremediation and Bioeconomy* (Ed: M.N. V. Prasad). Elsevier. 2016, pp: 457-493.
3. S. Vidyashankar, P.S. Daris, K.G. Mallikarjuna, R. Sarada. Microalgae as Source of Nutritional and Therapeutic Metabolites. In: *Plant Secondary Metabolites* (Ed: W. Siddiqui & K. Prasad). Apple Academic Press. 2016, pp: 1-29.

Patents filed

1. V.S. Chauhan, A. Kumudha, G.V. Swarnalatha, M.D. Kavitha, **S. Vidyashankar**, G.A. Ravishankar, R. Sarada. A composition and method to control rotifer infestation in microalgal culture system. (1787/DEL/2012), India, filed on 11th June 2012.

Awards and Honors

1. **2014 Awarded International Travel Grant by Dept. of Science and Technology (DST)** to present research paper at 5th Congress of International Society of Applied Phycology (ISAP) at Sydney, Australia. June 22-27 2014.
2. **2013 Awarded 1st prize for poster presentation at XXXIV annual meeting of Plant Tissue Culture Association (India), National Symposium on Plant Tissue Culture and Biotechnology for food and Nutritional Security** on paper entitled "Bioprospecting microalgae as sustainable source of nutritionally important fatty acids", CSIR-CFTRI, March 11-13, 2013.
3. **2009 Qualified Graduate Aptitude Test in Engineering (GATE), All India Rank - 587**
4. **2008 Qualified UGC-CSIR National Eligibility Test for Research and Teaching**
5. **2007 Awarded First Rank** at Undergraduate course - Bachelor in Science (Biosciences)

Certifications

1. **2014 Cleared National Institutes of Health, U.S.A web based course "Protecting Human Research Participants"**

References

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