

Areas of expertise

Phytoplankton ecology and productivity, algal biofuels, nutrient remediation, zooplankton ecology, biological oceanography, ecotoxicology, seagrass nutrient dynamics, environmental impact assessments.

Countries of work experience

Australia, Singapore, Malaysia, Thailand, India.

Overview of experience and qualifications

Dr. Nayar graduated from the National University of Singapore with a PhD in 2003. His dissertation investigated nutrient and biotic fluxes in relation to dispersal of pollutants in an anthropogenically impacted tropical estuary in Singapore. The project involved field monitoring and manipulative in situ ecotoxicological and photoadaptation experiments involving phytoplankton and bacteria. His thesis submitted in 1998 to the University of Agricultural Sciences for a Master's degree in Fisheries Science involved phytoplankton production in relation to hydrography in a tropical coastal lagoon off the southwest coast of India.

Soon after completing his PhD, Dr. Nayar joined the Tropical Marine Science Institute of the National University of Singapore working on environmental impact assessments for various government agencies. He has significant experience of over 15 years in a wide range of areas relating to aquatic biology, especially phytoplankton ecology and physiology. He also brings onboard his experience in handling ecological research projects in mangroves, coral reefs, estuarine reefs, seagrass meadows and coastal waters in the tropics and temperate environments. He has published over 25 papers in high impact international peer-reviewed journals on topics ranging from ecotoxicology to photoadaptation in diatoms. He has also presented his research in numerous international conferences and workshops and is regularly invited by grant agencies and journals to review grant proposals and manuscripts.

In 2004 he joined SARDI Aquatic Sciences as a Senior Research Officer investigating Nutrient

fluxes in the meadow forming seagrasses *Posidonia* and *Amphibolis* from the Adelaide metropolitan coast funded by the Adelaide Coastal Waters Study. The study used stable isotopes of nitrogen and carbon in benthic chambers deployed in situ. Chronic and acute toxicity response of seagrass to environmentally realistic concentrations of nutrients were also carried out in outdoor mesocosms.



Dr Nayar currently leads the Algal Production Group at SARDI, where he has developed a research program into algal biofuels supported by \$1.2 million in grants from the state government, federal government and the industry. In collaboration with Flinders University and CSIRO Energy Transformed Flagship researchers, he is developing a significant project on a second generation biorefinery for microalgal biofuels and value-added products utilising power plant emissions. Besides this, he has also played a key role in securing \$5 million through the National Collaborative Research Infrastructure Strategy to set up a 'National Photobioreactor facility' at SARDI West Beach.

Dr Nayar is also a principal investigator on CSIRO Flagship Collaboration funded project investigating microphytobenthic and phytoplankton productivity along a salinity gradient in the Coorong and Murray Mouth. This study used in situ benthic chambers to measure microphytobenthic productivity as well as C-14 spike experiments to measure phytoplankton productivity.



In early 2008 he participated in a 24 day voyage in the Southern Ocean onboard RV Southern Surveyor investigating the role of submarine canyons in upwelling, sediment transports and productivity hotspots off the Bonney Coast and Kangaroo Islands. As one of the 4 principal investigators, he studied spatial variations in size fractionated phytoplankton productivity in the upwelled zones of two submarine canyons off South Australia.

Professional appointments:

2006-present: Subprogram Leader & Phytoplankton Biologist, Algal Production Group, SARDI Aquatic Sciences.

2004-2006: Senior Research Officer, Adelaide Coastal Water Study, SARDI Aquatic Sciences.

2003-2004: Research Assistant, Tropical Marine Science Institute, National University of Singapore.

1999-2003: PhD, Department of Biological Sciences and Tropical Marine Science Institute, National University of Singapore.

1998-1999: Research Fellow, Department of Aquatic Biology, College of Fisheries, University of Agricultural Sciences, Mangalore, India.

1996-1998: MFSc, Department of Aquatic Biology, College of Fisheries, University of Agricultural Sciences, Mangalore, India.

Research and consulting

2008 : The role of submarine canyons in upwelling, sediment transports and productivity hotspots off the Bonney Coast and Kangaroo Islands', South Australia, funded by Marine National Facility RV Southern Surveyor.

2006-present: Second generation biorefinery for microalgal biofuels and value-added products utilising power plant emissions.

2006-2008: Microphytobenthic and phytoplankton productivity along a salinity gradient in the Coorong and Murray Mouth, funded by CSIRO Flagship Collaboration Fund : Water for a Healthy Country Flagship.

2004-2006: Nutrient fluxes in the meadow

forming seagrasses *Posidonia* and *Amphibolis* from the Adelaide metropolitan coast, funded by the Adelaide Coastal Water Study.

2003-2004: Monitoring and assessment of marine biodiversity of an estuarine intertidal reef of Singapore, funded by the Housing Development Board of Singapore.

2003-2004: Marine environment baseline classification of the port waters of Singapore funded by the Maritime & Port Authority of Singapore.

1999-2003: Nutrient and biotic fluxes in relation to dispersal of pollutants in an impacted estuary in Singapore.

1998-1999: Monitoring of riverine, estuarine and coastal waters off Mangalore, southwest India, funded by DANIDA.

1996-1998: Primary organic production in a tropical coastal lagoon, southwest India.

Contact

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