Biodiesel Production From Microalgae Lth

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Microalgae Jun 16 2020 Microalgae: Cultivation, Recovery of Compounds and Applications supports the scientific community, professionals and enterprises that aspire to develop industrial and commercialized applications of microalgae cultivation. Topics covered include conventional and emerging cultivation and harvesting techniques of microalgae, design, transport phenomena models of microalgae growth in photobioreactors, and the catalytic conversion of microalgae. A significant focus of the book illustrates how marine algae can increase sustainability in industries like food, agriculture, biofuel and bioprocessing, among others. This book is a complete reference for food scientists, technologists and engineers working in the bioresource technology field. It will be of particular interest to academics and professionals working in the food industry, food processing, chemical engineering and biotechnology. Explores emerging technologies for the clean recovery of antioxidants from microalgae Includes edible oil and biofuels production, functional food, cosmetics and animal feed applications Discusses microalgae use in sustainable agriculture and wastewater treatment Considers the techno-economic aspects of microalgae processing for biofuel, chemicals, pharmaceuticals and bioplastics

Biorefinery Nov 02 2021 This book discusses the biorefinery of biomass feedstocks. In-depth chapters highlight the scientific and technical aspects and present a techno-economic analysis of such systems. By using a TEA approach, the authors present feasible pathways for conversion of biomass (both residual biomass, energy crops and algae biomass), showing the different possibilities for the production of biochemical materials, biofuels, and fertilizers. The concepts presented in this book will link companies, investors, and governments by providing a framework that will help reduce pollutants and create a biomass related economy that incorporates the newest developments and technologies in the area.

Single Cell Oils Jan 24 2021 Featuring recognized academic and industrial experts in this cutting-edge field, this book reviews single cell oils (SCO) currently in the market. The text mainly focuses on the production of the long chain polyunsaturated fatty acids, Arachidonic acid, and Docosahexaenoic acid. All chapters provide up to date references for navigating the vast amount of historic data available in the field. The authors provide real world examples of the commercial development and applications of various SCO in a variety of fields, from food ingredients and disease treatment to aquaculture and fish farming. It covers the essential information in this fast moving field giving details of the production of all the major SCOs, their extraction, purification, applications and safety evaluations. In addition, this new edition includes major coverage of the potential of SCOs for biofuels that may be of key significance in the coming years. Includes sufficient detail on molecular breeding of yeasts and molds Shows how microbial oils have gone from being academic curiosities to being minor commodity oils Presents details on the safety and nutrition of single cell oils for human and animal nutrition

Water Quality Criteria Green Book of China Feb 05 2022

Water Intake, Body Water Regulation and Health Oct 09 2019 The purpose of this Special Issue, “Water Intake, Body Water Regulation, and Health”, is to present novel reviews and experimental data regarding hydration physiology and its implication in overall health. Water has previously been dubbed the forgotten nutrient due to humans’ and animals’ ability to subsist seemingly unchanged across a wide range of daily water intakes. However, with the introduction of stressors such as exercise, diseased states, and/or chronic high or low water intake, the homeostatic signals related to body water regulation can influence organ and whole-body health. This Special Issue will discuss water intake, the scientific rationale surrounding the U.S. and European water intake guidelines, homeostatic mechanisms, diseases related to dysfunction of water regulation, and differences in the volume and the vehicle in which the water is contained (i.e., plain water versus mixed beverages) on water intake during and following exercise. The aim is to continue discussion surrounding water, the previously forgotten nutrient, and highlight the importance of water in daily life.

Water Quality Criteria Green Book of China Jun 28 2021 The book mainly introduces readers to the development and current status of water quality criteria (WQC) in China and other countries or areas, and proposes a minimum toxicity data requirement (MTDR; i.e., six species from three phyla) as the principle metric for deriving WQC in China. Further, ten model species from 4 different phyla are recommended as domestic test species, and the methodologies for deriving aquatic life criteria, sediment criteria, ecocriteria and nutrient criteria in China are also described in detail. In order to demonstrate the methods, several representative chemical pollutants and aquatic environments are highlighted as examples. The book provides important references for future WQC-related research in China, which will make it of great interest to researchers and graduate students in the fields of environmental science, ecology and aquatic science etc.

Nutraceuticals and Functional Foods in Human Health and Disease Prevention Sep 19 2020 Functional foods and nutraceuticals, dietary supplements, and natural antioxidants have established their potential roles in the protection of human health against disease. Nutraceuticals and Functional Foods in Human Health and Disease Prevention examines the benefits, efficacy, and success of properly designed nutraceuticals and functional foods in human health and their possible application in disease prevention. The book demonstrates diverse disease pathophysiology and how nutraceuticals and functional food can be used to combat and prevent disease. The book discusses global food habits and trends, safety and toxicology, and how food addiction or overindulgence of food can lead to a variety of disease states. It then highlights how supplements help in disease prevention. Although a significant number of nutraceuticals and functional foods have demonstrated their efficacy, a large number of supplements are still surviving on false claims. Therefore, the editors underscore risks and benefits, and why government regulatory agencies are so critical of these nutraceutical supplements. With the global nutraceuticals market expected to reach

**Toxins in Food** Jan 04 2022 While systems such as GMP and HACCP assure a high standard of food quality, foodborne poisonings still pose a serious hazard to the consumer’s health. The lack of knowledge among some producers and consumers regarding the risks and benefits related to food makes it imperative to provide updated information in order to improve food safety. To

**New Microbiotests for Routine Toxicity Screening and Biomonitoring** May 08 2022 The determination of the hazards resulting from the accidental or deliberate contamination of terrestrial and aquatic environments is in most countries still limited to the detection and quantification of the suspected pollutants by chemical analyses. Such an approach is unfortunately hampered by the following constraints: the costs as well as the technical difficulties of analyzing every individual chemical which may be present in the samples, and the difficulty of assessing the hazards and risks of environmental contaminations from a set of chemical data. During the last decades the scientific and regulatory community has gradually realized that biological methodologies have to be taken into consideration for an ecologically meaningful assessment of the toxicological hazards of contaminants. Effect evaluations obtained with biological techniques indeed integrate the impact of all the contaminants to which living biota are exposed. Bioassays with selected test species representative for the biological communities of the environments under consideration, are now applied more or less regularly to determine toxic and genotoxic effects. Taking into account the species specific and chemical specific character of toxicity to biota, the necessity of a "battery of tests" approach with species of different trophic levels is currently also generally accepted and implemented. It is dear that a balanced partnership between chemical, biological, toxicological and microbiological analyses is always the best strategy for generating the broadest information base on environmental hazards.

**Algal Genetic Resources** Sep 12 2022 This book focuses on the current and potential applications of microalgae and cyanobacteria in pharmaceuticals, nutraceuticals, and cosmeceuticals. The book deals with the very recent and advanced techniques and technologies in algal cultivation and extraction for its application. The chapters discuss the biological importance, properties, and uses of algal metabolites and microalgal-based compounds in drug development, in food nutrition enhancement, and in the development of cosmetics with medicinal properties. The chapter authors cover a range of diverse topics on algal biological resources, such as: algae as a nutraceutical and functional food ingredient the extraction of food bioactive compounds from microalgae spirulina-derived nutraceuticals and their applications in the food industry antitumor compounds from freshwater microalgal cosmetic applications of microalgal and cyanobacterial pigments and more This unique book, Algal Genetic Resources: Cosmeceuticals, Nutraceuticals, and Pharmaceuticals from Algae, will enlighten readers on the vast usefulness of microalgae and cyanobacteria as an important resource for the cosmeceutical, pharmaceutical and nutraceutical industries for their broad biotechnological potential industrial applications. The volume will be a valuable reference for scientists and researchers in these areas as well as for advanced students and faculty in ecology, phycology, botany, agriculture, biotechnology, microbiology, environmental biotechnology, plant science, and life sciences.

**Fossil Free Fuels** May 16 2020 Many approaches have been undertaken to mitigate global climate change, including the movement away from fossil fuels. Fossil Free Fuels: Trends in Renewable Energy examines several key topics, such as the utilization of biofuels as a sustainable renewable resource, recycling and untapped waste-to-energy products, and other carbon-neutral strategies in various industries, such as the transportation, construction, and manufacturing sectors. It provides recent updates on the latest technologies, modeling, design, and technical aspects, as well as several practical case studies. The current world energy scenario is examined and various solutions to larger environmental problems are outlined in terms of the shift to more alternative energy sources. Features: Minimizes technical jargon in a straightforward style for a wider audience Discusses sustainable options for different industries, such as the use of green materials in the construction sector, biofuels for transportation, and many more Includes numerous illustrations, tables, and figures to aid in understanding This book serves as a practical reference for engineers, researchers, environmental consultants working in renewable energy industries, and students.

**Advances in Wastewater Treatment** Dec 03 2021 Advances in Wastewater Treatment presents a compendium of the key topics surrounding wastewater treatment, assembled by looking at the future technologies, and provides future perspectives in wastewater treatment and modelling. It covers the fundamentals and innovative wastewater treatment processes (such as membrane bioreactors and granular process). Furthermore, it focuses attention on mathematical modelling aspects in the field of wastewater treatments by highlighting the key role of models in process design, operation and control. Other topics include: • Anaerobic digestion • Biological nutrient removal • Instrumentation, control and automation • Computational fluid dynamics in wastewater • IFAS systems • New frontiers in wastewater treatment • Greenhouse gas emissions from wastewater treatment Each topic is addressed by discussing past, present and future trends. Advances in Wastewater Treatment is a valid support for researchers, practitioners and also students to have a frame of the frontiers in wastewater treatment and modelling.

**Green Materials for Wastewater Treatment** May 28 2021 This book reviews health hazards associated with wastewater use and water pollutants. Chapters present applications of green materials made of agricultural waste, activated carbon and magnetic materials for wastewater treatment. The removal of toxic metals using algal biomass and the removal of toxic dyes
using chitosan composite materials are also discussed. The book includes reviews on the removal of phenols, pesticides, and on the use of ionic liquid-modified activated carbon for the treatment of textile wastewater.

**Manual on Harmful Marine Microalgae** Jul 10 2022 This volume is a source book of protocols for studying, monitoring and managing harmful marine microalgae. Proliferation of microalgae in marine, brackish or fresh waters can cause massive fish kills, contaminate seafood with toxins and alter ecosystems in ways humans perceive as harmful. About 300 species of microalgae are reported to form mass occurrences, so-called 'blooms', and nearly one-fourth of these species are known to produce toxins. This manual covers the fields of harmful algal sampling, identification, culturing, toxin analysis, toxicology and management.

**Therapeutic, Probiotic, and Unconventional Foods** Nov 21 2020 Therapeutic, Probiotic and Unconventional Foods compiles the most recent, interesting and innovative research on unconventional and therapeutic foods, highlighting their role in improving health and life quality, their implications on safety, and their industrial and economic impact. The book focuses on probiotic foods, addressing the benefits and challenges associated with probiotic and prebiotic use. It then explores the most recently investigated and well-recognized nutraceutical and medicinal foods and the food products and ingredients that have both an impact on human health and a potential therapeutic effect. The third and final section explores unconventional foods and discusses intriguing and debated foods and food sources. While research has been conducted on the beneficial biological effects of probiotics and therapeutic food, the use of these foods remains controversial. To overcome the suspicion of the use of alternative, homeopathic and traditional products as therapy, this book reveals and discusses the most recent and scientifically sound and confirmed aspects of the research. Compiles the most recent, interesting and innovative research on unconventional and therapeutic foods Highlights the role of unconventional and therapeutic foods in improving health and life quality Discusses the implications of unconventional and therapeutic foods on safety Presents the industrial and economic impact of unconventional and therapeutic foods

**Marine Nutraceuticals and Functional Foods** Aug 19 2020 Two of the most popular nutraceutical products on the market, omega-3 oil and glucosamine, were originally derived from waste products. Discarded oil from the manufacture of fishmeal became wildly popular as omega-3, a polyunsaturated fat, and the fully hydrolyzed chitosan from shrimp and crab shell, glucosamine, found wide use in joint health. Hundreds of tons of marine by-products are available annually and previous commercial success, together with an overall consumer interest in novel healthy food ingredients, are driving both research and commercialization in the area of marine nutraceuticals. Edited by pioneers in the field, Marine Nutraceuticals and Functional Foods details information on a variety of commercially available and newly developing value-added products. Beginning with an overview of current marine nutraceuticals, the book discusses the origin of omega-3 oils, their beneficial effects on brain health, and their stabilization and delivery into functional foods. It covers the derivation and use of chitin, chitosan, and partially hydrolyzed chitosan as fat- and cholesterol absorbing agents and provides a detailed review of the health benefits and methods for the production of glucosamine. Providing an overview of the ACE-inhibitory and blood pressure reducing properties of marine proteins, it considers the functional constituents of marine algae and seaweed, including its carotenoids, and examines the cancer preventing potential of shark cartilage. The book also analyzes the use of marine microorganisms as a renewable resource and marine sources of calcium. The final chapter describes the discovery and development of a novel immunoenhancing polysaccharide complex derived from the microalgae, Chlorella. An unparalleled single-source reference to the discovery, development, and use of value-added products from marine sources, Marine Nutraceuticals and Functional Foods provides the foundation for continuing the dramatic growth in this exciting field.

**Handbook on Sourdough Biotechnology** Oct 01 2021 In the last few decades, many efforts have been made to exploit sourdough’s potential for making baked goods. Through the biotechnology of this traditional baking method, many sensory, rheological, nutritional, and shelf-life properties have been discovered and/or rediscovered. Bakery industries are greatly attracted by the potentials that sourdough presents, and new industrial protocols are being developed. To the best of our knowledge, there has been no single book dedicated to sourdough biotechnology, and which clearly demonstrate its potential. This book aims at defining and highlighting the microbiological, technological, nutritional, and chemical aspects of sourdough biotechnology. The book will be the first reference guide on this topic for the worldwide scientific, teaching and students communities, also opening a way of communication and transferring the main results to a more productive industrial application.

**Lipids in Photosynthesis: Structure, Function and Genetics** Apr 14 2020 Lipids in Photosynthesis provides readers with a comprehensive view of the structure, function and genetics of lipids in plants, algae and bacteria, with special emphasis on the photosynthetic apparatus in thylakoid membranes. This volume includes the historical background of the field, as well as a full review of our current understanding of the structure and molecular organization of lipids and their role in the functions of photosynthetic membranes. The physical properties of membrane lipids in thylakoid membranes and their relationship to photosynthesis are also discussed. Other topics include the biosynthesis of glycerolipids and triglycerides; reconstitution of photosynthetic structures and activities with lipids; lipid-protein interactions in the import of proteins into chloroplasts; the development of thylakoid membranes as it relates to lipids; genetic engineering of the unsaturation of membrane glycerolipids, with a focus on the ability of the photosynthetic machinery to tolerate temperature stress; and the involvement of chloroplast lipids in the reactions of plants upon exposure to stress. This book is intended for a wide audience and should be of interest to advanced undergraduate and graduate students and to researchers active in the field, as well as to those scientists whose fields of specialization include the biochemistry, physiology, molecular
biology, biophysics and biotechnology of membranes.

**Sustainable Downstream Processing of Microalgae for Industrial Application** Jun 09 2022 Microalgae can be future resource for industrial biotechnology In current energy crisis era, microalgae are under tremendous research focus for the production of biodiesel due to their high photosynthetic efficiency, growth rate and high lipid content compared to territorial plants. However, the large-scale production of algal biomass and downstream processing of harvested algae towards bio-fuels are facing several challenges from economic viability perspective. Apart from bio-fuels, the microalgae synthesize number of bio-molecules such as pigments (e.g., chlorophyll, carotenoid), protein (e.g., lectin, phycobiliprotein), and carbohydrates (e.g., agar, carrageenan, alginate, fucoside) which are available in the various forms of microalgal products. Therefore, developing a strategy for large-scale production and use of algal biomass for the co-production of these value-added macromolecules is thus imperative for the improvement of the economics of algal biofinery. In the above context, this book covers three major areas (i) commercial-scale production of bio-molecules from microalgae, (ii) sustainable approach for industrial-scale operation, and (iii) optimization of downstream processes. Each of these sections is composed of several chapters written by the renowned academicians/industry experts. Furthermore, in this book, a significant weightage is given to the industry experts (around 50%) to enrich the industrial perspectives. We hope that amalgamate of fundamental knowledge from academicians and applied research information from industry experts will be useful for forthcoming implementation of a sustainable integrated microalgal biofinery. This book highlights following.

Explores biomolecules from microalgae and their applications Discusses microalgae cultivations and harvesting Examines downstream processing of biomolecules Explores sustainable integrated approaches for industrial scale operations Examines purification techniques specific for microalgal proteins, Omega 3 fatty Acids, carbohydrates, and pigments

**Protein Functionality in Food Systems** Jul 18 2020 This volume examines the contributions of proteins to the technological and organoleptic characteristics of food. It provides a solid basis for understanding the principles of food protein functionality and offers information to help develop unique food products using proteins as novel ingredients. Properties such as solubility, viscosity, gelation, emulsification and foam formation are discussed.

**Source Separation and Decentralization for Wastewater Management** Jun 04 2019 Is sewer-based wastewater treatment really the optimal technical solution in urban water management? This paradigm is increasingly being questioned. Growing water scarcity and the insight that water will be an important limiting factor for the quality of urban life are main drivers for new approaches in wastewater management. Source Separation and Decentralization for Wastewater Management sets up a comprehensive view of the resources involved in urban water management. It explores the potential of source separation and decentralization to provide viable alternatives to sewer-based urban water management. During the 1990s, several research groups started working on source-separating technologies for wastewater treatment. Source separation was not new, but had only been propagated as a cheap and environmentally friendly technology for the poor. The novelty was the discussion whether source separation could be a sustainable alternative to existing end-of-pipe systems, even in urban areas and industrialized countries. Since then, sustainable resource management and many different source-separating technologies have been investigated. The theoretical framework and also possible technologies have now developed to a more mature state. At the same time, many interesting technologies to process combined or concentrated wastewaters have evolved, which are equally suited for the treatment of source-separated domestic wastewater. The book presents a comprehensive view of the state of the art of source separation and decentralization. It discusses the technical possibilities and practical experience with source separation in different countries around the world. The area is in rapid development, but many of the fundamental insights presented in this book will stay valid. Source Separation and Decentralization for Wastewater Management is intended for all professionals and researchers interested in wastewater management, whether or not they are familiar with source separation. Editors: Tove A. Larsen, Kai M. Uddert and Judit Lienert, Eawag - Swiss Federal Institute of Aquatic Science and Technology, Switzerland. Contributors: Yuval Aliyia, Technion - Israel Institute of Technology, Faculty of Civil and Environmental Engineering; Prof. Dr. M. Bruce Beck, University of Georgia, Warnell School of Forestry and Natural Resources; Dr. Christian Binz, Eawag, Swiss Federal Institute of Aquatic Science and Technology; Innovation Research in Utility Sectors (Cirus); Prof. em. Dr. Markus Boller, Eawag, Swiss Federal Institute of Aquatic Science and Technology, Department of Urban Water Management (SWW); Prof. Dr. Eran Friedler, Technion – Israel Institute of Technology, Faculty of Civil and Environmental Engineering; Zenah Bradford-Hartke, The University of New South Wales, School of Chemical Engineering and UNESCO Centre for Membrane Science and Technology; Dr. Shelley Brown-Malker, Very Small Particle Company Ltd; Bert Bundervoet, Ghent University, Laboratory Microbial Ecology and Technology (LabMET); Prof. Dr. David Butler, University of Exeter, Centre for Water Systems; Dr. Christopher A. Buzie, Hamburg University of Technology, Institute of Wastewater Management and Water Protection; Dr. Dana Cordell, University of Technology, Sydney (UTS), Institute for Sustainable Futures (ISF); Dr. Vasileios Diamantis, Democritus University of Thrace, Department of Environmental Engineering; Prof. Dr. Jan Willem Erisman, Louis Bolk Institute; VU University Amsterdam, Department of Earth Sciences; Barbara Evans, University of Leeds, School of Civil Engineering; Prof. Dr. Malin Falkenmark, Stockholm International Water Institute; Dr. Ted Gardner, Central Queensland University, Institute for Resource Industries and Sustainability; Dr. Heiko Gebauer, Eawag, Swiss Federal Institute of Aquatic Science and Technology, Innovation Research in Utility Sectors (Cirus); Prof. em. Dr. Willi Gujer, Swiss Federal Institute of Technology Zürich (ETHZ), Department of Civil, Environmental and Geomatic Engineering (BAUG); Prof. Dr. Bruce Jefferson, Cranfield University, Cranfield Water Science Institute; Prof. Dr. Paul Jeffrey, Cranfield University, Cranfield Water Science Institute; Sarina Jenni, Eawag, Swiss Federal Institute of Aquatic Science and Technology, Process Engineering
Innovative Wastewater Treatment & Resource Recovery Technologies: Impacts on Energy, Economy and Environment

Oct 21 2020
This book introduces the 3R concept applied to wastewater treatment and resource recovery under a double perspective. Firstly, it deals with innovative technologies leading to: Reducing energy requirements, space and impacts; Reusing water and sludge of sufficient quality; and Recovering resources such as energy, nutrients, metals and chemicals, including biopolymers. Besides targeting effective C,N&P removal, other issues such as organic micropollutants, gases and odours emissions are considered. Most of the technologies analysed have been tested at pilot- or at full-scale. Tools and methods for their Economic, Environmental, Legal and Social impact assessment are described. The 3R concept is also applied to Innovative Processes design, considering different levels of innovation: Retrofitting, where novel units are included in more conventional processes; Re-Thinking, which implies a substantial flowsheet modification; and Re-Imagining, with completely new conceptions. Tools are presented for Modelling, Optimising and Selecting the most suitable plant layout for each particular scenario from a holistic technical, economic and environmental point of view.

Bibliography of Agriculture with Subject Index
Apr 26 2021

Advances in Carbon Management Technologies
Apr 07 2022
Volume 2 of Advances in Carbon Management Technologies has 21 chapters. It presents the introductory chapter again, for framing the challenges that confront the proposed solutions discussed in this volume. Section 4 presents various ways biomass and biomass wastes can be manipulated to provide a low-carbon footprint of the generation of power, heat and co-products, and of recovery and reuse of biomass wastes for beneficial purposes. Section 5 provides potential carbon management solutions in urban and manufacturing environments. This section also provides state-of-the-art of battery technologies for the transportation sector. The chapters in section 6 deals with electricity and the grid, and how decarbonization can be practiced in the electricity sector. The overall topic of advances in carbon management is too broad to be covered in a book of this size. It was not intended to cover every possible aspect that is relevant to the topic. Attempts were made, however, to highlight the most important issues of
decarbonization from technological viewpoints. Over the years carbon intensity of products and processes has decreased, but the proportion of energy derived from fossil fuels has been stubbornly stuck at about 80%. This has occurred despite very rapid development of renewable fuels, because at the same time the use of fossil fuels has also increased. Thus, the challenges are truly daunting. It is hoped that the technology choices provided here will show the myriad ways that solutions will evolve. While policy decisions are the driving forces for technology development, the book was not designed to cover policy solutions.

**Waste to Wealth** Feb 22 2021 This book focuses on value addition to various waste streams, which include industrial waste, agricultural waste, and municipal solid and liquid waste. It addresses the utilization of waste to generate valuable products such as electricity, fuel, fertilizers, and chemicals, while placing special emphasis on environmental concerns and presenting a multidisciplinary approach for handling waste. Including chapters authored by prominent national and international experts, the book will be of interest to researchers, professionals and policymakers alike.

**Pyrolysis of Biomass** Nov 09 2019 With the development of societies fossil energy is no longer the only energy resource, and increasing attention had been paid to alternative energy. Biomass is considered to be one of the alternatives due to efficiency and low cost. This book presents biomass pyrolysis behavior for three main components: Cellulose, Hemicellulose and Lignin, and discusses the influence of mineral salts, zeolite catalysts and metal oxide on their pyrolysis.

**Algal Precipitation with Seeds from the Moringa Oleifera Tree** Aug 11 2022

**Microalgae-Based Biofuels and Bioproducts** Feb 11 2020 Microalgae-Based Biofuels and Bioproducts: From Feedstock Cultivation to End Products compiles contributions from authors from different areas and backgrounds who explore the cultivation and utilization of microalgae biomass for sustainable fuels and chemicals. With a strong focus in emerging industrial and large scale applications, the book summarizes the new achievements in recent years in this field by critically evaluating developments in the field of algal biotechnology, whilst taking into account sustainability issues and techno-economic parameters. It includes information on microalgae cultivation, harvesting, and conversion processes for the production of liquid and gaseous biofuels, such as biogas, bioethanol, biodiesel and biohydrogen. Microalgae biorefinery and biotechnology applications, including for pharmaceuticals, its use as food and feed, and value added bioproducts are also covered. This book’s comprehensive scope makes it an ideal reference for both early stage and consolidated researchers, engineers and graduate students in the algal field, especially in energy, chemical and environmental engineering, biotechnology, biology and agriculture. Presents the most current information on the uses and untapped potential of microalgae in the production of bio-based fuels and chemicals Critically reviews the state-of-the-art feedstock cultivation of biofuels and bioproducts mass production from microalgae, including intermediate stages, such as harvesting and extraction of specific compounds Includes topics in economics and sustainability of large-scale microalgae cultivation and conversion technologies

**Organic Waste Recycling: Technology, Management and Sustainability** Aug 07 2019 This fourth edition of Organic Waste Recycling is fully updated with new material to create a comprehensive and accessible textbook: - New chapter on constructed wetlands for wastewater and faecal sludge stabilization. - New sections on: waste recycling vs. climate change and water; faecal sludge and its characteristics; hydrothermal carbonization technology; up-to-date environmental criteria and legislation and environmental risk assessment. - New case studies with emphasis on practices in both developed and developing countries have been included, along with more exercises at the end of chapters to help the readers understand the technical principles and their application. - Novel concepts and strategies of waste management are presented. - Up-to-date research findings and innovative technologies of waste recycling program are provided. This textbook is intended for undergraduate and graduate students majoring in environmental sciences and engineering as well as researchers, professionals and policy makers who conduct research and practices in the related fields. It is essential reading for experts in environmental science and engineering and sustainable waste reuse and recycling in both developed and developing countries.

**Domestic Wastewater Treatment in Developing Countries** Dec 11 2019 Affordable and effective domestic wastewater treatment is a critical issue in public health and disease prevention around the world, particularly so in developing countries which often lack the financial and technical resources necessary for proper treatment facilities. This practical guide provides state-of-the-art coverage of methods for domestic wastewater treatment and provides a foundation to the practical design of wastewater treatment and re-use systems. The emphasis is on low-cost, low-energy, low-maintenance, high-performance 'natural' systems that contribute to environmental sustainability by producing effluents that can be safely and profitably used in agriculture for crop irrigation and/or in aquaculture, for fish and aquatic vegetable pond fertilization. Modern design methodologies, with worked design examples, are described for waste stabilization ponds, wastewater storage and treatment reservoirs; constructed wetlands, upflow anaerobic sludge blanket reactors, biofilters, aerated lagoons and oxidation ditches. This book is essential reading for engineers, academics and upper-level and graduate students in engineering, wastewater management and public health, and others interested in sustainable and cost-effective technologies for reducing wastewater-related diseases and environmental damage.

**Functional Food Product Development** Mar 14 2020 According to an August 2009 report from PricewaterhouseCoopers, the United States market for functional foods in 2007 was US$ 27 billion. Forecasts of growth range from between 8.5% and 20% per year, or about four times that of the food industry in general. Global demand by 2013 is expected to be about $100 billion. With this demand for new products comes a demand for product development and supporting literature for that purpose. There is a wealth of research and
development in this area and great scope for commercialization, and this book provides a much-needed review of important opportunities for new products, written by authors with in-depth knowledge of as yet unfulfilled health-related needs. This book addresses functional food product development from a number of perspectives: the process itself; health research that may provide opportunities; idea creation; regulation; and processes and ingredients. It also features case studies that illustrate real product development and commercialization histories. Written for food scientists and technologists, this book presents practical information for use in functional food product development. It is an essential resource for practitioners in functional food companies and food technology centres and is also of interest to researchers and students of food science. Key features: A comprehensive review of the latest opportunities in this commercially important sector of the food industry Includes chapters highlighting functional food opportunities for specific health issues such as obesity, immunity, brain health, heart disease and the development of children. New technologies of relevance to functional foods are also addressed, such as emulsion delivery systems and nanoencapsulation. Includes chapters on product design and the use of functional ingredients such as antioxidants, probiotics and prebiotics as well as functional ingredients from plant and dairy sources Specific examples of taking products to market are provided in the form of case studies e.g. microalgae functional ingredients Part of the Functional Food Science and Technology book series (Series Editor: Fereidoon Shahidi) Advances in Environmental Pollution Management: Wastewater Impacts and Treatment Technologies Sep 07 2019 Advances in Environmental Pollution Management: Wastewater Impacts and Treatment Technologies has been designed to bind novel knowledge of wastewater pollution-induced impacts on various aspects of our environment. The book also contains novel methods and tools for the monitoring and treatment of produced wastewater.

**Functional Diversity and Composition of Microalgae and Photosynthetic Bacteria in Marine Wetlands** Oct 13 2022

**Mathematical Modelling and Computer Simulation of Activated Sludge Systems** Aug 31 2021 Mathematical Modelling and Computer Simulation of Activated Sludge Systems – Second Edition provides, from the process engineering perspective, a comprehensive and up-to-date overview regarding various aspects of the mechanistic (“white box”) modelling and simulation of advanced activated sludge systems performing biological nutrient removal. In the new edition of the book, a special focus is given to nitrogen removal and the latest developments in modelling the innovative nitrogen removal processes. Furthermore, a new section on micropollutant removal has been added. The focus of modelling has been shifting in the last years to models that can describe the performance of a whole plant (plant-wide modelling). The expanded part of this new edition introduces models describing the most important processes interrelated with the mainstream activated sludge systems as well as models describing the energy balance, operating costs and environmental impact. The complex process evaluation, including minimization of energy consumption and carbon footprint, is in line with the present and future wastewater treatment goals. By combining a general introduction and a textbook, this book serves both intermediate and more experienced model users, both researchers and practitioners, as a comprehensive guide to modelling and simulation studies. The book can be used as a supplemental material at graduate and post-graduate levels of wastewater engineering/modelling courses.

**Freshwater Microplastics** Dec 23 2020 This book is open access under a CC BY 4.0 license. This volume focuses on microscopic plastic debris, also referred to as microplastics, which have been detected in aquatic environments around the globe and have accordingly raised serious concerns. The book explores whether microplastics represent emerging contaminants in freshwater systems, an area that remains underrepresented to date. Given the complexity of the issue, the book covers the current state-of-research on microplastics in rivers and lakes, including analytical aspects, environmental concentrations and sources, modelling approaches, interactions with biota, and ecological implications. To provide a broader perspective, the book also discusses lessons learned from nanomaterials and the implications of plastic debris for regulation, politics, economy, and society. In a research field that is rapidly evolving, it offers a solid overview for environmental chemists, engineers, and toxicologists, as well as water managers and policy-makers.

**Algal Adaptation to Environmental Stresses** Mar 26 2021 Algae, generally held as the principal primary producers of aquatic systems, inhabit all conceivable habitats. They have great ability to cope with a harsh environment, e.g. extremely high and low temperatures, suboptimal and supraoptimal light intensities, low availability of essential nutrients and other resources, and high concentrations of toxic chemicals, etc. A multitude of physiological, biochemical, and molecular strategies enable them to survive and grow in stressful habitats. This book presents a critical account of various mechanisms of stress tolerance in algae, many of which may occur in microbes and plants as well.

**Sediment Quality Assessment** Jul 30 2021 Contaminated sediments represent an ongoing threat to the health of aquatic ecosystems. The assessment of sediment quality is, therefore, an important concern for environmental regulators. Sediment quality guidelines are now well established in regulatory frameworks worldwide; however, practical guidance that covers all of the key aspects of sediment quality assessment is not readily available. In 2005, CSIRO published its highly cited Handbook for Sediment Quality Assessment. In the ensuing period, the science has advanced considerably. This practical guide is a revised and much expanded second edition, which will be a valuable tool for environmental practitioners. Written by experts in the field, it provides coverage of: sediment sampling; sample preparation; chemical analysis; ecotoxicology; bioaccumulation; biomarkers; and ecological assessment. In addition, detailed appendices describe protocols for many of the tests to be used.

**Phytobiont and Ecosystem Restitution** Mar 06 2022 This book offers present-day retrospectives and future perspectives on ‘phytobiont’ studies in the context of phyto-micro restitution, filling some of the information gaps in this promising research field. It discusses several ecosystem restitution strategies using dissimilar groups of microbes alone or in
association with plants, as well as advances in metagenomics technology for studying in situ micro and macro communities in contaminated soil. It addresses topics such as the status quo, and the perspectives of microbial researchers and scientists, foresters, students, environmentalists, agriculturists and professional engineers. The rising pollution levels caused by xenobiotics is one of the biggest problems of our times, and as such the book comprehensively elaborates the latest research in this field and describes how the issue can be tackled using micro-organisms. With detailed diagrams and illustrations, the book is a valuable resource for experts and novices in the field of microbial bioremediation, phyto-bioremediation and environmental microbiology.