




Handbook of Marine Macroalgae

Biotechnology and Applied Phycology

Editor | Se-Kwon Kim

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Handbook Of Marine Macroalgae Biotechnology And Applied Phycology

Herminia Dominguez



Handbook Of Marine Macroalgae Biotechnology And Applied Phycology:

Handbook of Marine Macroalgae Se-Kwon Kim, 2011-11-04 The Handbook of Macroalgae Biotechnology and Applied Phycology describes the biological biotechnological and the industrial applications of seaweeds Vast research into the cultivation of seaweeds is currently being undertaken but there is a lack of methodological strategies in place to develop novel drugs from these sources This book aims to rectify this situation providing an important review of recent advances and potential new applications for macroalgae Focusing on the chemical and structural nature of seaweeds the book brings the potentially valuable bioactive nature to the fore Novel compounds isolated from seaweeds are reviewed to provide an invaluable reference for anyone working in the field **Handbook of Microalgae-Based Processes and Products** Eduardo Jacob-Lopes, Mariana Manzoni Maroneze, Maria Isabel Queiroz, Leila Queiroz Zepka, 2020-07-23 The Handbook of Microalgae based Processes and Products provides a complete overview of all aspects involved in the production and utilization of microalgae resources at commercial scale Divided into four parts fundamentals microalgae based processes microalgae based products and engineering approaches applied to microalgal processes and products the book explores the microbiology and metabolic aspects of microalgae microalgal production systems wastewater treatment based in microalgae CO₂ capture using microalgae microalgae harvesting techniques and extraction and purification of biomolecules from microalgae It covers the largest number of microalgal products of commercial relevance including biogas biodiesel bioethanol biohydrogen single cell protein single cell oil biofertilizers pigments polyunsaturated fatty acids bioactive proteins peptides and amino acids bioactive polysaccharides sterols bioplastics UV screening compounds and volatile organic compounds Moreover it presents and discusses the available engineering tools applied to microalgae biotechnology such as process integration process intensification and techno economic analysis applied to microalgal processes and products microalgal biorefineries life cycle assessment and exergy analysis of microalgae based processes and products The coverage of a broad range of potential microalgae processes and products in a single volume makes this handbook an indispensable reference for engineering researchers in academia and industry in the fields of bioenergy sustainable development and high value compounds from biomass as well as graduate students exploring those areas Engineering professionals in bio based industries will also find valuable information here when planning or implementing the use of microalgal technologies Covers theoretical background information and results of recent research Discusses all commercially relevant microalgae based processes and products Explores the main emerging engineering tools applied to microalgae processes including techno economic analysis process integration process intensification life cycle assessment and exergy analyses **Microbial Functional Foods and Nutraceuticals** Vijai Kumar Gupta, Helen Treichel, Volha (Olga) Shapaval, Luiz Antonio de Oliveira, Maria G. Tuohy, 2017-10-30 Showcases the recent advances in microbial functional food applications across food science microbiology biotechnology and chemical engineering Microbial technology plays a key role in the improvement of

biotechnology cosmeceuticals and biopharmaceutical applications It has turned into a subject of expanding significance because new microbes and their related biomolecules are distinguished for their biological activity and health benefits Encompassing both biotechnology and chemical engineering Microbial Functional Foods and Nutraceuticals brings together microbiology bacteria and food processing mechanization which have applications for a variety of audiences Pharmaceuticals diagnostics and medical device development all employ microbial food technology The book addresses the recent advances in microbial functional foods and associated applications providing an important reference work for graduates and researchers It also provides up to date information on novel nutraceutical compounds and their mechanisms of action catering to the needs of researchers and academics in food science and technology microbiology chemical engineering and other disciplines who are dealing with microbial functional foods and related areas Microbial Functional Foods and Nutraceuticals is Ground breaking Includes the latest developments and research in the area of microbial functional foods and nutraceuticals Multidisciplinary Applicable across food science and technology microbiology biotechnology chemical engineering and other important research fields Practical and academic An important area of both academic research and new product development in the food and pharmaceutical industries Microbial Functional Foods and Nutraceuticals is an ideal resource of information for biologists microbiologists bioengineers biochemists biotechnologists food technologists enzymologists and nutritionists Seaweed Sustainability Brijesh K. Tiwari,2015-08-27 Seaweed Sustainability Food and Non Food

Applications is the only evidence based resource that offers an abundance of information on the applications of seaweed as a solution to meet an increasing global demand for sustainable food source The book uncovers seaweed potential and describes the various sources of seaweed the role of seaweeds as a sustainable source for human food and animal feeds and the role of seaweed farming for sustainability In addition to harvesting and processing information the book discusses the benefits of seaweed in human nutrition and its nutraceutical properties Offers different perspectives by presenting examples of commercial utilization of wild harvested or cultivated algae marine and freshwater seaweeds Discusses seasonal and cultivar variations in seaweeds for a better understanding of their implications in commercial applications Includes a wide range of micro and macro algae for food and feed production and provides perspectives on seaweed as a potential energy source

Advances in Food and Nutrition Research Fidel Toldra,2020-02-11 Approx 322 pages **Plant Secondary Metabolites for Human Health** Megh R. Goyal,P. P. Joy,Hafiz Ansar Rasul Suleria,2019-08-21 This new book deals with recent advanced research on natural products and health promoting foods that work to reduce the risk of diseases while enhancing overall well being Plant based functional foods are known to contain compounds also referred to as phytochemicals in the leaves stems flowers and fruits of certain plants These plant products are drawing the attention of researchers because of their demonstrated beneficial effects against disease particularly diabetes hypertension cancer neurodegenerative diseases among others The medicinal and nutritional use of plant secondary metabolites is a hot topic and has been receiving extensive

attention from both health professionals and the public This book presents new information on the extraction of bioactive compounds from plants plant based drugs and the innovative use of plant based drugs for human health **Edible**

Seaweeds of the World Leonel Pereira,2016-01-08 Seaweed is used in many countries for very different purposes directly as food especially in sushi as a source of phycocolloids extraction of compounds with antiviral antibacterial or antitumor activity and as biofertilizers About four million tons of seaweed are harvested annually worldwide Of the various species known less than 20 account *Food Packaging* Rui M. S. da Cruz,2019-11-11 Food Packaging Innovations and Shelf life

covers recently investigated developments in food packaging and their influence in food quality preservation shelf life extension and simulation techniques Additionally the book discusses the environmental impact and sustainable solutions of food packaging This book is divided into seven chapters written by worldwide experts The book is an ideal reference source for university students food engineers and researchers from R D laboratories working in the area of food science and technology Professionals from institutions related to food packaging **Functional Ingredients from Algae for Foods**

and Nutraceuticals Herminia Dominguez,2013-09-30 Algae have a long history of use as foods and for the production of food ingredients There is also increasing interest in their exploitation as sources of bioactive compounds for use in functional foods and nutraceuticals Functional ingredients from algae for foods and nutraceuticals reviews key topics in these areas encompassing both macroalgae seaweeds and microalgae After a chapter introducing the concept of algae as a source of biologically active ingredients for the formulation of functional foods and nutraceuticals part one explores the structure and occurrence of the major algal components Chapters discuss the chemical structures of algal polysaccharides algal lipids fatty acids and sterols algal proteins phlorotannins and pigments and minor compounds Part two highlights biological properties of algae and algal components and includes chapters on the antioxidant properties of algal components anticancer agents derived from marine algae anti obesity and anti diabetic activities of algae and algae and cardiovascular health Chapters in part three focus on the extraction of compounds and fractions from algae and cover conventional and alternative technologies for the production of algal polysaccharides Further chapters discuss enzymatic extraction subcritical water extraction and supercritical CO₂ extraction of bioactives from algae and ultrasonic and microwave assisted extraction and modification of algal components Finally chapters in part four explore applications of algae and algal components in foods functional foods and nutraceuticals including the design of healthier foods and beverages containing whole algae prebiotic properties of algae and algae supplemented products algal hydrocolloids for the production and delivery of probiotic bacteria and cosmeceuticals from algae Functional ingredients from algae for foods and nutraceuticals is a comprehensive resource for chemists chemical engineers and medical researchers with an interest in algae and those in the algaculture food and nutraceutical industries interested in the commercialisation of products made from algae Provides an overview of the major compounds in algae considering both macroalgae seaweeds and microalgae Discusses methods for the extraction of

bioactives from algae Describes the use of algae and products derived from them in the food and nutraceutical industries

Recent Advances in Micro- and Macroalgal Processing Gaurav Rajauria,Yvonne V. Yuan,2021-04-06 Recent Advances in Micro and Macroalgal Processing A comprehensive review of algae as novel and sustainable sources of algal ingredients their extraction and processing This comprehensive text offers an in depth exploration of the research and issues surrounding the consumption economics composition processing and health effects of algae With contributions from an international team of experts the book explores the application of conventional and emerging technologies for algal processing The book includes recent developments such as drying and milling technologies along with advancements in sustainable greener techniques The text also highlights individual groups of compounds including polysaccharides proteins polyphenols carotenoids lipids and fibres from algae The authors provide insightful reviews of the traditional and more recent applications of algae algal extracts in food feed pharmaceutical and cosmetics products Offering a holistic view of the various applications the book looks at the economic feasibility market trends and considerations and health hazards associated with algae for industrial applications This important book Provides a comprehensive overview of algal biomolecules and the role of emerging processing technologies Explores the potential biological and health benefits of algae and their applications in food pharmaceuticals and cosmetic products Includes a current review of algal bioactives and processing technologies for food and ingredient manufacturers Contains contributions from leading academic and industrial experts Written for food scientists allied researchers and professional food technologists Recent Advances in Micro and Macroalgal Processing Food and Health Perspectives offers a guide to the novel processing and extraction techniques for exploring and harnessing the immense potential of algae

Seaweed in Health and Disease Prevention Joël Fleurence,Ira Levine,2016-04-05 Seaweed in Health and Disease Prevention presents the potential usage of seaweed macroalgae and their extracts for enhancing health and disease The book explores the possibilities in a comprehensive way including outlining how seaweed can be used as a source of macronutrients and micronutrients as well as nutraceuticals The commercial value of seaweed for human consumption is increasing year over year and some countries harvest several million tons annually This text lays out the properties and effects of seaweeds and their use in the food industry offering a holistic view of the ability of seaweed to impact or effect angiogenesis tumors diabetes and glucose control oxidative stress fungal infections inflammation and infection the gut and the liver Combines foundational information and nutritional context offering a holistic approach to the relationship between sea vegetables diet nutrition and health Provides comprehensive coverage of health benefits including sea vegetables as sources of nutraceuticals and their specific applications in disease prevention such as angiogenesis diabetes fungal infections and others Includes Dictionary of Terms Key Facts and Summary points in each chapter to enhance comprehension Includes information on toxic varieties and safe consumption guidelines to supplement basic coverage of health benefits

Coralline Algae: Globally Distributed Ecosystem Engineers Laurie Carol

Hofmann,Nick Kamenos,João Silva,Nadine Schubert,Paulo Antunes Horta,Julio Aguirre,Kathryn Schoenrock,2020-07-08

Making CO2 a Resource Øyvind Stokke,Elin M. Oftedal,2024-06-03 This interdisciplinary book explores how CO2 can become a resource instead of a waste and as such be a tool to meet one of the grandest challenges humanity is facing climate change Drawing on a Norwegian narrative that has significance for a global audience yvind Stokke and Elin Oftedal introduce in depth multi perspective analyses of a sustainable innovation research experiment in industrial carbon capture and utilisation technologies Building on extensive literature within marine sciences sustainability research and environmental philosophy and ethics this book documents how a misplaced resource like CO2 can become valuable within a circular economy in its own right while at the same time meeting the challenge of food security in a world where food production is increasingly under pressure The book is diverse in scope and includes chapters on how to reduce the environmental footprint of aquaculture by replacing wild fish and soy from the Amazon how to optimise the monitoring of aquatic environments via smart technologies and how to replace materials otherwise sourced from natural environments The authors also analyse the pivotal role of the university in driving innovation and entrepreneurship the pitfalls of different carbon technologies and explore how the link between petroleum dependence and CO2 emissions has been addressed in Norway specifically Making CO2 a Resource will be of great interest to students and scholars of climate change

environmental ethics environmental philosophy sustainable business and innovation and sustainable development more broadly **Polysaccharides** Bhasha Sharma,M. Enamul Hoque,2023-12-14 Polysaccharides offer unique and valuable functional properties persisting in technological importance and poised to grow more critical due to sustainability demands and emerging applications in medical and life sciences This book presents comprehensive information about carbohydrate polymers providing readers with an enhanced appreciation of carbohydrate structure and function a new enzyme library and extraction strategies that will help to advance a number of exciting domains of research including genomics proteomics chemical synthesis materials science and engineering Key Features Details the source production structures properties and current and potential applications of polysaccharides Discusses general strategies of isolation separation and characterization of polysaccharides Describes botanical algal animal and microbial sources of polysaccharides Demonstrates the importance of carbohydrates in new lead generation Highlights the range of possibilities for polysaccharides to make real world impact

Seafood Processing By-Products Se-Kwon Kim,2014-04-08 The seafood processing industry produces a large amount of by products that usually consist of bioactive materials such as proteins enzymes fatty acids and biopolymers These by products are often underutilized or wasted even though they have been shown to have biotechnological nutritional pharmaceutical and biomedical applications For example by products derived from crustaceans and algae have been successfully applied in place of collagen and gelatin in food cosmetics drug delivery and tissue engineering Divided into four parts and consisting of twenty seven chapters this book discusses seafood by product development isolation and

characterization and demonstrates the importance of seafood by products for the pharmaceutical nutraceutical and biomedical industries *Food Bioactives and Health* Charis M. Galanakis, 2021-02-15 Bioactive natural compounds have gained attention in recent years due to their potential health benefits including reducing the risk of diabetes cancer and cardiovascular diseases These benefits derive from bioactive compounds anti tumor anti inflammatory anti oxidative anti hypertensive and anti hyperlipidemic activities which serve in addition to their basic nutritional functions Over the last decade researchers have investigated the health impact of bioactive compounds in detail and the development of food applications has attracted great interest Consumer demand has surged for functional foods nutraceuticals superfoods and tailor made foods generated by supplementing traditional food products with bioactive ingredients *Food Bioactives and Health* offers comprehensive coverage of the properties and health effects of food bioactives in view of new trends in processing food science and food technology Starting with the metabolic characteristics of polyphenols glucosinolates and other food bioactives the text then dives into their impact on human health and recent applications in the world of food technology For food scientists food technologists and product developers looking to understand the role of food bioactives in health and develop applications in personalized nutrition functional foods and nutraceuticals *Food Bioactives and Health* serves as a one stop reference *Marine Glycobiology* Se-Kwon Kim, 2016-10-14 Marine glycobiology is an emerging and exciting area in the field of science and medicine Glycobiology the study of the structure and function of carbohydrates and carbohydrate containing molecules is fundamental to all biological systems and represents a developing field of science that has made huge advances in the last half century This book revolutionizes the concept of marine glycobiology focusing on the latest principles and applications of marine glycobiology and their relationships *Tropical Seaweed Farming Trends, Problems and Opportunities* Anicia Q. Hurtado, Alan T. Critchley, Iain C. Neish, 2017-10-17 This book collates the latest information on Kappaphycus and Eucheuma seaweeds The edited volume provides an important companion to anyone studying or working with what is the world s largest cultivated marine plant biomass The contributing authors have excelled in providing information on production and present and future uses of these carrageenan bearing seaweeds Important elements of taxonomy distribution and methods of cultivation and processing are presented to the reader in an accessible and easily understood format The book provides a number of valuable opinions on value addition and MUZE technologies which highlight value chains associated with these important red algae *Climate Resilient Innovative Livelihoods in Indian Sundarban Delta* Abhijit Mitra, Sufia Zaman, Prosenjit Pramanick, 2023-09-26 This book covers several innovative alternative livelihoods based on mangrove floral resources with their respective SWOT analysis True mangrove flora and their associates in Indian Sundarbans are noted for their wide spectrum of ecosystem services in which livelihoods of the region are one of the most important components Many alternative mangrove centric livelihoods are in the pipeline of startup However due to difficulty in marketing and lack of clarity over ownership of natural resources the values of the mangrove based products

have not been fully realized Natural resources of several categories in Indian Sundarbans like oysters seaweeds medicinal mangrove flora vitamin rich mangrove fruits etc are still lying untapped These untapped resources have been spun with the livelihood sectors of the Sundarban people backed up with sound business models to make the venture sustainable The carbon foot prints associated with each of these livelihoods have been studied in details and steps have been suggested for net zero carbon livelihood programmes along with their sustainability The book provides the readers about several mangrove based cutting edge researches and technologies in the domain of climate resilient livelihood which if implemented can lead to food and economic security of the region

Algal Biorefineries and the Circular Bioeconomy Sanjeet

Mehariya, Obulisamy Parthiba Karthikeyan, Shashi Kant Bhatia, 2022-04-19 Algae are mysterious and fascinating organisms that hold great potential for discovery and biotechnology Dr Thierry Tonon Department of Biology University of York Science is a beautiful gift to humanity we should not distort it A P J Abdul Kalam In this book we emphasize the importance of algal biotechnology as a sustainable platform to replace the conventional fossil based economy With this focus Volume 2 summarizes the up to date literature and knowledge and discusses the advances in algal cultivation genetic improvement wastewater treatment resource recovery commercial operation and technoeconomic analysis of algal biotechnology FEATURES Discusses in detail recent developments in algae cultivation and biomass harvesting Provides an overview of genetic engineering and algal bacteria consortia to improve productivity Presents applications of algae in the area of wastewater treatment and resource recovery Provides case studies and technoeconomic analysis to understand the algal biorefinery Shashi Kant Bhatia PhD is an Associate Professor in the Department of Biological Engineering Konkuk University Seoul South Korea Sanjeet Mehariya PhD is a Postdoctoral Researcher at the Department of Chemistry Ume University Ume Sweden Obulisamy Parthiba Karthikeyan PhD is a Research Scientist and Lecturer Adjunct in the Department of Civil and Environmental Engineering South Dakota School of Mines and Technology Rapid City South Dakota USA

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