# Epub free Natural compounds from algae and spirulina platensis its (2023)

this book provides a structured account of the existing knowledge of toxic algae the chemistry of the toxins they produce the effects these substances exert in humans and wildlife as well as the strategies envisaged to protect public health and the environment it covers recent advances in the understanding of the biology of toxin producers and toxins and biologically active compounds from microalgae volume 2 biological effects and risk management is devoted to the effects toxic microalgae and their poisonous products exert on living systems and how they may affect human activities the most advanced information regarding the molecular mechanisms of action of major groups of next generation algae the book comprehensively details the novel and biologically active compounds derived from algae for sustainable healthcare delivery that could be used for the treatment of an ever increasing population prevention of high rate of morbidity rates as well as in the treatment of numerous diseases and serve as an alternative drug for the prevention of high level of resistance to synthetic drugs this second volume places a special emphasis on the discovery of novel and biologically active compounds from algae it covers a wide range of applications including the use of astaxanthin and carotenoids derived from algae for the production of nutraceuticals pharmaceuticals additives food supplements and feed the book also discusses the production of polyunsaturated fatty acids pufas and their biomedical applications recent advancements in the research of sulfated polysaccharides from algal origin and their antiulcer bioactivities other topics include the application of algae in wound healing the use of nanotechnology for the bioengineering of useful metabolites derived from algae and their multifaceted applications and the production of single cell proteins and pigments with high relevance in the industry audience researchers in industry and academia as well as clinicians in the fields of microbiology biotechnology and food science will find this book very pertinent algae based polymers blends and composites chemistry biotechnology and material sciences offers considerable detail on the origin of algae extraction of useful metabolites and major compounds from algal bio mass and the production and future prospects of sustainable polymers derived from algae blends of algae and algae based composites characterization methods and processing techniques for algae based polymers and composites are discussed in detail enabling researchers to apply the latest techniques to their own work the conversion of bio mass into high value chemicals energy and materials

has ample financial and ecological importance particularly in the era of declining petroleum reserves and global warming algae are an important source of biomass since they flourish rapidly and can be cultivated almost everywhere at present the majority of naturally produced algal biomass is an unused resource and normally is left to decompose similarly the use of this enormous underexploited biomass is mainly limited to food consumption and as bio fertilizer however there is an opportunity here for materials scientists to explore its potential as a feedstock for the production of sustainable materials provides detailed information on the extraction of useful compounds from algal biomass highlights the development of a range of polymers blends and composites includes coverage of characterization and processing techniques enabling research scientists and engineers to apply the information to their own research and development discusses potential applications and future prospects of algae based biopolymers giving the latest insight into the future of these sustainable materials 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 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 microalgae 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 anticancer compounds from freshwater microalgae 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 brown algae comprise approx 2040 species grown in various climatic conditions they represent a reservoir of various bioactive compounds including fucoidan alginate phlorotannins and fucoxanthins they have shown an array of applications in pharmaceutical and medical fields hence the guest editor invites all interested authors to submit their contributions to the current issue in marine drugs entitled bioactive compounds from brown algae it aims to highlight different aspects of bioactive compounds found in brown algae in either research or review articles specifically we are interested in downstream processes chemistry biotechnology and applications of for example heteropolysaccharides and other brown algae bioactives in addition the structure elucidation and enzymatic modification of these components are also within the scope of the present issue 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 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 this book is a compendium of knowledge on the useful properties of algae in the context of application as a useful component of innovative natural products it presents all aspects of industrial applications of macroalgae biomass derived from the natural environment despite many interesting characteristics algae are still regarded as undervalued raw material therefore present in

the following chapters are not only environmental benefits arising from the development of excessive algal biomass but also the distribution and biology of algae in natural conditions in reservoirs methods of obtaining extracts from biomass of algae for industrial purposes furthermore it also includes topics such as the use of biomass and algae extracts for the industrial purposes in animal breeding and for agricultural purposes as well as the economic aspects of algae biomass harvesting for industrial purposes the book is intended for a wide audience interested in new methods of obtaining the biomass from the natural environment for industrial purposes and the manufacture of products based on bioactive substances obtained from the environment the aim and scope of this book is to highlight the sources isolation characterization and applications of bioactive compounds from the marine environment and to discuss how marine bioactive compounds represent a major market application in food and other industries it discusses sustainable marine resources of macroalgal origin and gives examples of bioactive compounds isolated from these and other resources including marine by product and fisheries waste streams in addition it looks at the importance of correct taxonomic characterization 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 algae materials applications benefitting health offers a comprehensive analysis of biosensors algae materials for clinical applications algae polymers proteins and pigments algae for food applications and packaging blue economy algae forming cosmetics and more the book enlists the less explored areas of algal bioproducts including how the application of genetic engineering is currently used to enhance bioproducts even though there are numerous reviews and scattered documents available there are some recent fields yet to explore offers a comprehensive analysis of biosensors algae materials for clinical applications algae polymers proteins and pigments algae for food applications and packaging enlists the less explored areas of algal bioproducts like how applications of genetic engineering are used to enhance bioproducts includes recent findings and often excluded areas in microalgae research available in a single source algae have been used since ancient times as food for humans animal feed agricultural fertilizer and as a source of substances for therapeutic use currently seaweed represents a vast source of raw materials used in the pharmaceutical food traditional medicine and cosmetics industries they are nutritionally valuable both fresh and dried or as ingredients in a wide variety of pre made foods in particular seaweed contains significant amounts of protein lipids minerals and vitamins information is limited on the role of algae and their metabolites in therapy only a few taxa have been studied for use in medicine many traditional cultures report the healing powers of selected algae in tropical and subtropical marine forms this is especially true in the maritime areas of asia where the sea plays a significant role in daily activities however currently only a few genera and species of algae are involved in aspects of medicine and therapy the beneficial uses of seaweed or seaweed products include those that can mimic specific manifestations of human disease production of antibiotic compounds or improved human nutrition algal world has been carefully written and edited with an interdisciplinary appeal and aims to bring all aspects of algae together in one volume the 22 chapters are divided into two different parts which have been authored by eminent researchers from across the world the first part biology of algae contains 10 chapters dealing with the general characteristics classification and description of different groups such as blue green algae green algae brown algae red algae diatoms xanthophyceae dinophyceae etc in it has two important chapters covering algae in extreme environments and life histories and growth forms in green algae the second part applied phycology contains 12 chapters dealing with

the more applied aspects ranging from algal biotechnology biofuel phycoremediation bioactive compounds biofertilizer fatty acids harmful algal blooms industrial applications of seaweeds nanotechnology phylogenomics and algal culture techniques etc edible algae including seaweeds are a source of functional food dietary supplements metabolites and bioactive compounds algal based functional foods have potential health benefits and their commercial value depends on their applications in the food and nutraceutical industries this book covers several aspects of algal based functional foods it informs the reader about algal cultivation techniques environmental impact habitat nutraceutical potential extraction of bioactive metabolites functional food composition bio prospection culture induced nutraceutical compounds algae based bio packaging algal biorefinery toxicity trends and future prospects the editors present the topics in a research oriented format while citing scholarly references this book is a comprehensive resource for anyone interested in the nutritional benefits and industrial utilization of algae as a sustainable food source 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 microalgaediscusses methods for the extraction of bioactives from algaedescribes the use of algae and products derived from them in the food and nutraceutical industries algae offer potential to produce renewable chemicals and fuels using solar energy and carbon dioxide from atmosphere or in flue gases while simultaneously reducing the generation of greenhouse gases since these can be grown on marginal lands with micronutrients and macronutrients often present in waste streams algae based chemicals and fuels do not compete with foods still large scale production of algae based fuels and chemicals faces considerable technological and economical challenges and it would by necessity require a biorefinery approach wherein all the possible algal components are converted into value added compounds the present series on algal biorefineries represents a forum for reporting the state of the art of different technologies as well as the latest advances in this field the volume ii of this series complements the volume i in terms of the current state of the art different chapters in this volume address diverse issues ranging from genetically modifies algae to new products to life cycle analysis of algal products marine organisms are potentially prolific sources of highly bioactive secondary metabolites that might represent useful leads in the development of new pharmaceutical agents algae can be classified into two main groups first one is the microalgae which includes blue green algae flagellates bacillariophyte diatoms etc and second one is macroalgae which includes green brown and red algae marine algal species produce a variety of compounds that are ultimately beneficial to human health marine algae are a famous fragility in some parts of world and also a well known source of important food phlorotannin s pigments and sulfated polysaccharides compared to the terrestrial plants and animal based foods seaweed is rich in some health promoting molecules and materials such as dietary fibre  3 fatty acids essential amino acids and vitamins a b c and e the marine world due to its phenomenal biodiversity is a rich natural resource of many biologically active compounds many marine organisms live in complex habitats exposed to extreme conditions and in adapting to new environmental surroundings they produce a wide variety of secondary biologically active metabolites which cannot be found in other organisms furthermore considering its great taxonomic diversity investigations related to the search of new bioactive compounds from the marine environment can be seen as an almost unlimited field marine algal bioactive enlightens readers on the numerous bioactive of marine algae in drug discovery and development ranging from the preliminary research to clinical trial increasing knowledge regarding the impact of diet on human health along with state of the art technologies has led to

significant nutritional discoveries product innovations and mass production on an unprecedented scale specifically naturally occurring bioactive extracts or single compounds thereof that are believed beneficial to human health have produced an important and dynamic new extent of research resulting in significant developments in nutritional familiarity the marine environment signifies a relatively untapped source of functional ingredients that can be useful to various aspects of food processing storage and fortification furthermore in this text several marine based compounds have been recognised as having varied biological activities with some reported to interfere with the pathogenesis of diseases algae are some of the fastest growing organisms in the world with up to 90 of their weight made up from carbohydrate protein and oil as well as these macromolecules microalgae are also rich in other high value compounds such as vitamins pigments and biologically active compounds all these compounds can be extracted for use by the cosmetics pharmaceutical nutraceutical and food industries and the algae itself can be used for feeding of livestock in particular fish where on going research is dedicated to increasing the percentage of fish and shellfish feed not derived from fish meal microalgae are also applied to wastewater bioremediation and carbon capture from industrial flue gases and can be used as organic fertilizer so far only a few species of microalgae including cyanobacteria are under mass cultivation the potential for expansion is enormous considering the existing hundreds of thousands of species and subspecies in which a large gene pool offers a significant potential for many new producers completely revised updated and expanded and with the inclusion of new editor qiang hu of arizona state university the second edition of this extremely important book contains 37 chapters nineteen of these chapters are written by new authors introducing many advanced and emerging technologies and applications such as novel photobioreactors mass cultivation of oil bearing microalgae for biofuels exploration of naturally occurring and genetically engineered microalgae as cell factories for high value chemicals and techno economic analysis of microalgal mass culture this excellent new edition also contains details of the biology and large scale culture of several economically important and newly exploited microalgae including botryococcus chlamydomonas nannochloropsis nostoc chlorella spirulina haematococcus and dunaniella species strains edited by amos richmond and qiang hu each with a huge wealth of experience in microalgae its culture and biotechnology and drawing together contributions from experts around the globe this thorough and comprehensive new edition is an essential purchase for all those involved with microalgae their culture processing and use biotechnologists bioengineers phycologists pharmaceutical biofuel and fish feed industry personnel and biological scientists and students will all find a vast amount of cutting edge information within this second edition

libraries in all universities where biological sciences biotechnology and aquaculture are studied and taught should all have copies of this landmark new edition on their shelves key features the most comprehensive resource available on the biodiversity of algal species their industrial production processes and their use for human consumption in food health and varied applications emphasis on basic and applied research addressing aspects of scale up for commercial exploitation for the development of novel phytochemicals phytochemicals from algae addresses the underexplored and underutilized potential of chemicals from marine sources for health benefits each chapter written by expert contributors from around the world includes a dictionary of terms key facts summary points figures and tables as well as up to date references the second book in this two volume set explores phycoremedation applications and the sustainable use of algae for biofuels and other products of economic value it also looks at aspects such as macro and micro algal impact on marine ecosystem and remote sensing of algal blooms the commercial value of chemicals of value to food and health is about 6 billion annually of which 30 percent relates to micro and macro algal metabolites and products for health food applications as a whole the two volumes explore the aspects of diversity of micro and macro algal forms their traditional uses their constituents which are of value for food feed specialty chemicals bioactive compounds for novel applications and bioenergy molecules bio business and the market share of algae based products are also dealt with providing global perspectives seas and oceans offer a wide range of temperature pressure light and chemical conditions thus allowing a wide diversity of marine organisms from shallow coastal waters to the deep ocean these resources can be used to obtain new products and develop services and in turn help to provide solutions to the challenges that affect our planet including offering a sustainable supply of food and energy new industrial materials and processes new bioactive compounds and new health treatments marine compounds have been identified as having antibacterial anticoagulant antifungal antimalarial antiprotozoal antituberculosis and antiviral activities the major sources of these bioactive compounds are marine sponges coelenterates and microorganisms followed by algae echinoderms tunicates molluscs and bryozoans the discovery of bioactive compounds from marine samples is a hot topic considering the current need for sustainable use of marine resources this book is a comprehensive overview of the analytical techniques employed in the discovery and characterization of bioactive compounds isolated from all possible marine samples and gives future perspectives of analytical methodologies this overview includes an assessment of the sampling and preparation of extracts the separation and isolation of bioactive compounds their structural characterization and the application of bioassays in the discovery of bioactive compounds comprehensive coverage of analytical

techniques and applications clear diagrams to adequately support important topics real examples of applications of analytical techniques in the search for new bioactive compounds cultured microalgae for the food industry current and potential applications is a comprehensive reference that addresses the current applications and potential uses of microalgae and microalgae derived compounds in the food industry the book explores the different steps of the subject from strain selection and cultivation steps to the assessment of the public perception of microalgae consumption and the gastronomical potential of this innovative resource readers will find coverage of microalgae biology common and uncommon algae species cultivation strategies for food applications novel extraction techniques safety issues regulatory issues and current market opportunities and challenges this title also explores the gastronomic potential of microalgae and reviews current commercialized products along with consumer attitudes surrounding microalgae covering relevant up to date research as assembled by a group of contributors who are experts in their respective fields the book is an essential reading for advanced undergraduates postgraduates and researchers in the microbiology biotechnology food science and technology fields thoroughly explores the optimization cultivation and extraction processes for increased bioactive compound yields includes industrial functionality bio accessibility and the bioavailability of the main compounds obtained from microalgae presents novel trends and the gastronomic potential of microalgae utilization in the food industry in the recent past many advances have been made in the field of biology and biotechnology of algae especially microalgae this book includes chapters on taxonomy diversity and physiology of blue green algae as these organisms are most important from biotechnological point of view use of algae as biofertilizer source of natural colours bioactive compounds phytochemicals with pharmaceutical and biotechnological applications food and feed has been discussed environmental pollution is the major problem all over the world the potential of algae in combating water pollution is also highlighted depleting fossil fuel is another concern and it is felt that there is a need for alternative renewable resources algae as a potential source of biofuel are also discussed in this book this contributed volume presents the latest research and state of the art approaches in the study of microalgae it describes in detail technologies for the cultivation of marine freshwater and extremophilic algae as well as phototrophic biofilms cyanobacterial mats and periphytons including the media requirements and growth rates of different types of algae the second part of the book is dedicated to the biotechnological applications of algal biomass and secondary metabolites produced by these organisms and critically discusses topics such as algae based biofuels and co2 sequestration in addition it reviews the prospects and challenges of algal bioremediation of domestic and industrial wastewaters including the use of

planktonic and self immobilized algae systems in wastewater treatment explaining their merits and drawbacks lastly it highlights research methods and approaches related to the production of high value products and bioactive compounds a single source reference on the biology of algae the third edition of algae anatomy biochemistry and biotechnology examines the most important taxa and structures for freshwater marine and terrestrial forms of algae its comprehensive coverage goes from algae s historical role through its taxonomy and ecology to its natural product possibilities in this update the authors have gathered a significant amount of new material including more information on macroalgae detailed description of biotic associations updated description of biomass cultivation systems coverage of different omic approaches and tools used in algal investigation an expanded and updated algae utilization chapter the book s unifying theme is the important role of algae in the earth s self regulating life support system and its function within restorative models of planetary health it also discusses algae s biotechnological applications including potential nutritional and pharmaceutical products written for students as well as researchers teachers and professionals in the field of phycology and applied phycology this new full color edition is both illuminating and inspiring algae organisms for imminent biotechnology will be useful source of information on basic and applied aspects of algae for post graduate students researchers scientists agriculturists and decision makers the book comprises a total of 12 chapters covering various aspects of algae particularly on microalgal biotechnology bloom dynamics photobioreactor design and operation of microalgal mass cultivation algae used as indicator of water quality microalgal biosensors for ecological monitoring in aquatic environment carbon capture and storage by microalgae to enhancing co2 removal synthesis and biotechnological potentials of algal nanoparticles biofilms silica based nanovectors challenges and opportunities in marine algae and genetic identification and mass propagation of economically important seaweeds and seaweeds as source of new bioactive prototypes seaweeds around the world state of art and perspectives volume 95 includes discussions on current research conducted in the field of algae specific chapters cover isotopic labeling of cultured macroalgae and isolation of 13c labeled cell wall polysaccharides for trophic investigations selected red seaweeds from the philippines with emerging high value applications challenges to the future domestication of seaweed cultivated species understanding individual needs and physiological processes for large scale production the importance of mucilage in dispersion and efficiency of fertilization of male gametes the application of seaweeds in environmental biotechnology indonesian sargassum species prospecting potential applications of bioactive compounds and much more presents the most recent biological knowledge and advances on seaweed content covers innovations to biotechnological aquacultural and

chemical developments about seaweeds field written by the most experienced authors in the field in this book researchers and practitioners working in the field present the major promises of algae biotechnology and they critically discuss the challenges arising from applications based on this assessment the authors explore the great scientific industrial and economic potential opened up by algae biotechnology the first part of the book presents recent developments in key enabling technologies which are the driving force to unleash the enormous potential of algae biotechnology the second part of the book focuses on how practical applications of algae biotechnology may provide new solutions to some of the grand challenges of the 21st century algae offer great potential to support the building of a bio based economy and they can contribute new solutions to some of the grand challenges of the 21st century despite significant progress algae biotechnology is yet far from fulfilling its potential how to unleash this enormous potential is the challenge that the own field is facing new cultivation technologies and bioprocess engineering allow for optimization of the operation strategy of state of the art industrial scale production systems and they reduce the production costs parallel to this new molecular technologies for genetic and metabolic engineering of micro algae develop quickly the optimization of existing biochemical pathways or the introduction of pathway components makes high yield production of specific metabolites possible novel screening technologies including high throughput technologies enables testing of extremely large numbers of samples and thus allow for large scale modelling of biomolecular processes which would have not been possible in the past moreover profitable production can demand for integrated biorefining which combines consecutive processes and various feedstocks to produce both transportation fuel electric energy and valuable chemicals 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 this special issue presents high quality research papers as well as review articles addressing recent advances in the use of marine bioactives in animal nutrition the marine environment constitutes a relatively untapped source of biologically active compounds that can be applied in various areas such as improvement of animal performance health maintenance and disease prevention numerous marine based compounds isolated

from marine organisms especially seaweeds have diverse biological activities including antioxidative anti inflammatory antibacterial antifungal and antiviral activities that can be beneficial to animal health additionally the application of marine bioactives as feed additives can increase the nutritional value of products of animal origin in this special issue the main attention was focused on seaweeds and their application in poultry laying hen and broiler chickens and pig feed the suitable processing of marine resources required for their optimal use as feed feed additives was underlined the contained publications present scientific evidence for the use of various seaweeds as feed additives that improve health enhanced immunity prebiotic effect growth performance and production inclusion of this unconventional material in animal nutrition can enrich products with active compounds such as micro and macroelements polyunsaturated fatty acids and pigments which are beneficial for consumers the marine environment covers 70 of the earth s surface and accounts for 98 of the potentially habitable space the bioactives from marine microorganisms include antibiotic compounds polysaccharides inhibitors enzymes peptides and pigments these are used in various fields of biology that range from nutraceuticals to cosmeceuticals recent scientific investigations have revealed that marine microbial compounds exhibit various beneficial biological effects such as anti inflammatory anti cancer anti hiv anti hypertensive and anti diabetic marine microorganisms extraction and analysis of bioactive compounds sheds light on the extraction clean up and detection methods of major compounds from marine organisms the book includes information on the different classes of marine microorganisms and the different bioactives that can be extracted from bacteria fungi and microalgae divided into 7 chapters the book covers bioactive marine natural products such as marine microbes seaweeds and marine sponges as potential sources of drug discovery and focuses on analysis methods of the biocomponents from marine microorganisms a useful reference tool for researchers and students this book provides current knowledge about isolation and analysis methods of the bioactives and provides insight into the various bioactives of marine microbes toward nutraceutical and pharmaceutical development this two volume work presents comprehensive accurate information on the present status and contemporary development in phycoremediation of various types of domestic and industrial wastewaters the volume covers a mechanistic understanding of microalgae based treatment of wastewaters including current challenges in the treatment of various organic and inorganic pollutants and future opportunities of bioremediation of wastewater and industrial effluents on an algal platform the editors compile the work of authors from around the globe providing insight on key issues and state of the art developments in algal bioremediation that is missing from the currently available body of literature the volume hopes to serve as a much needed

resource for professors researchers and scientists interested in microalgae applications for wastewater treatment volume 1 focuses on the different aspects of domestic and industrial wastewater treatment by microalgae the case studies include examples such as genetic technologies as well as the development and efficient use of designer consortia for enhanced utilization of microalgae this volume provides thorough and comprehensive information on removal of persistent and highly toxic contaminants such as heavy metals organic pesticides polyaromatic hydrocarbons endocrine disruptors pharmaceutical compounds and dyes from wastewater by microalgae diatoms and blue green algae design considerations for algal ponds and efficient use of photobioreactors and hraps for wastewater treatment are some other highlights this volume addresses the applications potentials and future opportunities for these various considerations in water pollution mitigation using algal technologies algae for food cultivation processing and nutritional benefits algae are a primitive living photosynthetic form and they are the oldest living organism in the marine ecosystem algae are the primary producers that supply energy required to a diverse marine organism and especially seaweed provides a habitat for invertebrates and fishes there have been significant advances in many areas of phycology this book describes the advances related to food and nutrition of algae achieved during the last decades it also identifies gaps in the present knowledge and needs for the future the 17 chapters grouped into 6 parts are written by phycologists more insight on industrial exploitation of algae and their products is supported by current studies and will help academia the first part explains new technologies to improve the microalgal biomass strain improvement and different methods of seaweed cultivation in the second part food and nutraceutical applications of algae food safety aspects green nanotechnology and formulation methods for the extraction and isolation of algal functional foods are described the third part deals with pigments and carotenoids while the fourth part exploits the isolation and application of hydrocolloids nutritional implications of algal polysaccharides and the characterization and bioactivity of fucoidans in the fifth part the biomedical potential of seaweed followed by agricultural applications of algae are well described the book is an important resource for scholars that provides knowledge on wide range of topics key features covers important fields of algae from biomass production to genetic engineering aspects of algae useful in the field of algal biotechnology aquaculture marine micro and macrobiology microbial biotechnology and bioprocess technology focuses on the therapeutic and nutritional areas of algae part of the ift press series this book reviews the myriadpublished information on bioactive components derived from marinefoods enabling researchers and product developers to selectappropriate functional ingredients for new products chapters cover foods and food ingredients from both

animal andplant marine sources focusing on those which demonstratebiological properties and whose constituent compounds have beenisolated and identified as potentially active this book furtheraddresses the biological activities of pufas polyunsaturated fattyacids oils phospholipids proteins and peptides fibres carbohydrates chitosans vitamins and minerals fucoxantin polyphenols phytosterols taurine amongst others thesecomponents found in a variety of marine derived foods have beendemonstrated to have preventative properties with regard tohypertension oxidative stress inflammation cardiovasculardiseases cancer and other human diseases extraction methods and analysis techniques are also addressed intended for food scientists food technologists and food engineersin academia industry and government this book reviews thesubstantial quantity of current research in this fast moving andcommercially valuable sector of food and nutrition science algae are an important group of organisms which are found in a wide range of habitats be it oceans rivers fresh water lakes ponds or brackish water bodies snow barks of the trees etc ranging from a small tiny cell to the giant kelp measuring up to several metres this group of plants have some unique features which are not found in any other group of organisms algae have both prokaryotic and eukaryotic groups large varieties of pigment systems triphasic life cycle and a long evolutionary history algae have also changed the planet s atmosphere by producing oxygen thus paving the way for evolution of life on earth these tiny organisms not only give us oxygen to breathe food to eat medicines to heal and cosmetics to use but they also provide a lot of information about the origin of life it has been predicted that not only vehicles will run on algal biofuels in the future but power plants will use algae for carbon dioxide sequestration despite its huge importance algae remains a much neglected subject because of its stereotype boring class room table materials as pond scum globally algae is already a multi billion dollar industry employing large numbers of people in various industries and their value is set to increase in future therefore the purpose of writing and editing this book is not to publish one more text book in the field of phycology but to give an alternative outlook and encouragement to our readers and students to understand feel and unravel the beauty and use of this group of organisms in many different ways the 22 chapters are divided into two different parts which have been authored by eminent researchers from across the world the first part biology of algae contains 10 chapters dealing with the general characteristics classification and description of different groups such as blue green algae green algae brown algae red algae diatoms xanthophyceae dinophyceae etc in addition it has two important chapters covering algae in extreme environments and life histories and growth forms in green algae the second part applied phycology contains 12 chapters dealing with the more applied aspects ranging from algal biotechnology biofuel

phycoremediation bioactive compounds biofertilizer fatty acids harmful algal blooms industrial applications of seaweeds nanotechnology phylogenomics and algal culture techniques etc this volume has been carefully written and edited with an interdisciplinary appeal and aims to bring all aspects of algae together in one volume algae have been used since ancient times as food fodder fertilizer and as source of medicine nowadays seaweeds represent an unlimited source of the raw materials used in pharmaceutical food industries medicine and cosmetics they are nutritionally valuable as fresh or dried vegetables or as ingredients in a wide variety of prepared foods in particular seaweeds contain significant quantities of protein lipids minerals and vitamins there is limited information about the role of algae and algal metabolites in medicine only a few taxa have been studied for their use in medicine many traditional cultures report curative powers from selected alga in particular tropical and subtropical marine forms this is especially true in the maritime areas of asia where the sea plays a significant role in daily activities nonetheless at present only a few genera and species of algae are involved in aspects of medicine and therapy beneficial uses of algae or algal products include those that may mimic specific manifestations of human diseases production of antibiotic compounds or improvement of human nutrition in obstetrics dental research thallassotherapy and forensic medicine the author presents a state of the art account of research in algal production and utilization dr becker provides a compilation of the different methods employed worldwide for the artificial cultivation of different microalgae including recipes for culture media description of outdoor and indoor cultivation systems as well as harvesting and procesing methods the book will be essential reading for advanced undergraduates postgraduates and researchers in the field

## Toxins and Biologically Active Compounds from Microalgae, Volume 1

2016-04-19

this book provides a structured account of the existing knowledge of toxic algae the chemistry of the toxins they produce the effects these substances exert in humans and wildlife as well as the strategies envisaged to protect public health and the environment it covers recent advances in the understanding of the biology of toxin producers and

## *Toxins and Biologically Active Compounds from Microalgae, Volume 2*

2014-04-24

toxins and biologically active compounds from microalgae volume 2 biological effects and risk management is devoted to the effects toxic microalgae and their poisonous products exert on living systems and how they may affect human activities the most advanced information regarding the molecular mechanisms of action of major groups of

## Next-Generation Algae, Volume 2

2023-05-31

next generation algae the book comprehensively details the novel and biologically active compounds derived from algae for sustainable healthcare delivery that could be used for the treatment of an ever increasing population prevention of high rate of morbidity rates as well as in the treatment of numerous diseases and serve as an alternative drug for the prevention of high level of resistance to synthetic drugs this second volume places a special

emphasis on the discovery of novel and biologically active compounds from algae it covers a wide range of applications including the use of astaxanthin and carotenoids derived from algae for the production of nutraceuticals pharmaceuticals additives food supplements and feed the book also discusses the production of polyunsaturated fatty acids pufas and their biomedical applications recent advancements in the research of sulfated polysaccharides from algal origin and their antiulcer bioactivities other topics include the application of algae in wound healing the use of nanotechnology for the bioengineering of useful metabolites derived from algae and their multifaceted applications and the production of single cell proteins and pigments with high relevance in the industry audience researchers in industry and academia as well as clinicians in the fields of microbiology biotechnology and food science will find this book very pertinent

## Algae Based Polymers, Blends, and Composites

2017-06-19

algae based polymers blends and composites chemistry biotechnology and material sciences offers considerable detail on the origin of algae extraction of useful metabolites and major compounds from algal bio mass and the production and future prospects of sustainable polymers derived from algae blends of algae and algae based composites characterization methods and processing techniques for algae based polymers and composites are discussed in detail enabling researchers to apply the latest techniques to their own work the conversion of bio mass into high value chemicals energy and materials has ample financial and ecological importance particularly in the era of declining petroleum reserves and global warming algae are an important source of biomass since they flourish rapidly and can be cultivated almost everywhere at present the majority of naturally produced algal biomass is an unused resource and normally is left to decompose similarly the use of this enormous underexploited biomass is mainly limited to food consumption and as bio fertilizer however there is an opportunity here for materials scientists to explore its potential as a feedstock for the production of sustainable materials provides detailed information on the extraction of useful compounds from algal biomass highlights the development of a range of polymers blends and composites includes coverage of characterization and processing techniques enabling research scientists and engineers to apply

the information to their own research and development discusses potential applications and future prospects of algae based biopolymers giving the latest insight into the future of these sustainable materials

## Functional Ingredients from Algae for Foods and Nutraceuticals

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

## Algal Genetic Resources

2022-09-29

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 microalgae 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 anticancer compounds from freshwater microalgae 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

## Bioactive Compounds from Brown Algae

2021

brown algae comprise approx 2040 species grown in various climatic conditions they represent a reservoir of various bioactive compounds including

fucoidan alginate phlorotannins and fucoxanthins they have shown an array of applications in pharmaceutical and medical fields hence the guest editor invites all interested authors to submit their contributions to the current issue in marine drugs entitled bioactive compounds from brown algae it aims to highlight different aspects of bioactive compounds found in brown algae in either research or review articles specifically we are interested in downstream processes chemistry biotechnology and applications of for example heteropolysaccharides and other brown algae bioactives in addition the structure elucidation and enzymatic modification of these components are also within the scope of the present issue

## Microalgae

2020-10-05

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

## Recent Advances in Micro- and Macroalgal Processing

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

## Algae Biomass: Characteristics and Applications

2018-07-09

this book is a compendium of knowledge on the useful properties of algae in the context of application as a useful component of innovative natural products it presents all aspects of industrial applications of macroalgae biomass derived from the natural environment despite many interesting characteristics algae are still regarded as undervalued raw material therefore present in the following chapters are not only environmental benefits arising from the development of excessive algal biomass but also the distribution and biology of algae in natural conditions in reservoirs methods of obtaining extracts from biomass of algae for industrial purposes furthermore it also includes topics such as the use of biomass and algae extracts for the industrial purposes in animal breeding and for agricultural purposes as well as the economic aspects of algae biomass harvesting for industrial purposes the book is intended for a wide audience interested in new methods of obtaining the biomass from the natural environment for industrial purposes and the manufacture of products based on bioactive substances obtained from the environment

## Marine Bioactive Compounds

2011-11-19

the aim and scope of this book is to highlight the sources isolation characterization and applications of bioactive compounds from the marine environment and to discuss how marine bioactive compounds represent a major market application in food and other industries it discusses sustainable marine resources of macroalgal origin and gives examples of bioactive compounds isolated from these and other resources including marine by product and fisheries waste streams in addition it looks at the importance of correct taxonomic characterization

## Handbook of Microalgae-Based Processes and Products

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

## Algae Materials

2023-02-22

algae materials applications benefitting health offers a comprehensive analysis of biosensors algae materials for clinical applications algae polymers proteins and pigments algae for food applications and packaging blue economy algae forming cosmetics and more the book enlists the less explored areas of algal bioproducts including how the application of genetic engineering is currently used to enhance bioproducts even though there are

numerous reviews and scattered documents available there are some recent fields yet to explore offers a comprehensive analysis of biosensors algae materials for clinical applications algae polymers proteins and pigments algae for food applications and packaging enlists the less explored areas of algal bioproducts like how applications of genetic engineering are used to enhance bioproducts includes recent findings and often excluded areas in microalgae research available in a single source

## Characterization of Bioactive Components in Edible Algae

2020-04-15

algae have been used since ancient times as food for humans animal feed agricultural fertilizer and as a source of substances for therapeutic use currently seaweed represents a vast source of raw materials used in the pharmaceutical food traditional medicine and cosmetics industries they are nutritionally valuable both fresh and dried or as ingredients in a wide variety of pre made foods in particular seaweed contains significant amounts of protein lipids minerals and vitamins information is limited on the role of algae and their metabolites in therapy only a few taxa have been studied for use in medicine many traditional cultures report the healing powers of selected algae in tropical and subtropical marine forms this is especially true in the maritime areas of asia where the sea plays a significant role in daily activities however currently only a few genera and species of algae are involved in aspects of medicine and therapy the beneficial uses of seaweed or seaweed products include those that can mimic specific manifestations of human disease production of antibiotic compounds or improved human nutrition

## *The Algae World*

2015-12-16

algal world has been carefully written and edited with an interdisciplinary appeal and aims to bring all aspects of algae together in one volume the 22

chapters are divided into two different parts which have been authored by eminent researchers from across the world the first part biology of algae contains 10 chapters dealing with the general characteristics classification and description of different groups such as blue green algae green algae brown algae red algae diatoms xanthophyceae dinophyceae etc in it has two important chapters covering algae in extreme environments and life histories and growth forms in green algae the second part applied phycology contains 12 chapters dealing with the more applied aspects ranging from algal biotechnology biofuel phycoremediation bioactive compounds biofertilizer fatty acids harmful algal blooms industrial applications of seaweeds nanotechnology phylogenomics and algal culture techniques etc

## Algal Functional Foods and Nutraceuticals: Benefits, Opportunities, and Challenges

2022-11-29

edible algae including seaweeds are a source of functional food dietary supplements metabolites and bioactive compounds algal based functional foods have potential health benefits and their commercial value depends on their applications in the food and nutraceutical industries this book covers several aspects of algal based functional foods it informs the reader about algal cultivation techniques environmental impact habitat nutraceutical potential extraction of bioactive metabolites functional food composition bio prospection culture induced nutraceutical compounds algae based bio packaging algal biorefinery toxicity trends and future prospects the editors present the topics in a research oriented format while citing scholarly references this book is a comprehensive resource for anyone interested in the nutritional benefits and industrial utilization of algae as a sustainable food source

## Functional Ingredients from Algae for Foods and Nutraceuticals

2017-11-13

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 microalgaediscusses methods for the extraction of bioactives from algaedescribes the use of algae and products derived from them in the food and nutraceutical industries

## Algal Biorefineries

2015-10-19

algae offer potential to produce renewable chemicals and fuels using solar energy and carbon dioxide from atmosphere or in flue gases while simultaneously reducing the generation of greenhouse gases since these can be grown on marginal lands with micronutrients and macronutrients often

present in waste streams algae based chemicals and fuels do not compete with foods still large scale production of algae based fuels and chemicals faces considerable technological and economical challenges and it would by necessity require a biorefinery approach wherein all the possible algal components are converted into value added compounds the present series on algal biorefineries represents a forum for reporting the state of the art of different technologies as well as the latest advances in this field the volume ii of this series complements the volume i in terms of the current state of the art different chapters in this volume address diverse issues ranging from genetically modifies algae to new products to life cycle analysis of algal products

## *Marine Algal Bioactives*

2017-02

marine organisms are potentially prolific sources of highly bioactive secondary metabolites that might represent useful leads in the development of new pharmaceutical agents algae can be classified into two main groups first one is the microalgae which includes blue green algae flagellates bacillariophyte diatoms etc and second one is macroalgae which includes green brown and red algae marine algal species produce a variety of compounds that are ultimately beneficial to human health marine algae are a famous fragility in some parts of world and also a well known source of important food phlorotannin s pigments and sulfated polysaccharides compared to the terrestrial plants and animal based foods seaweed is rich in some health promoting molecules and materials such as dietary fibre  3 fatty acids essential amino acids and vitamins a b c and e the marine world due to its phenomenal biodiversity is a rich natural resource of many biologically active compounds many marine organisms live in complex habitats exposed to extreme conditions and in adapting to new environmental surroundings they produce a wide variety of secondary biologically active metabolites which cannot be found in other organisms furthermore considering its great taxonomic diversity investigations related to the search of new bioactive compounds from the marine environment can be seen as an almost unlimited field marine algal bioactive enlightens readers on the numerous bioactive of marine algae in drug discovery and development ranging from the preliminary research to clinical trial increasing knowledge regarding the impact of

diet on human health along with state of the art technologies has led to significant nutritional discoveries product innovations and mass production on an unprecedented scale specifically naturally occurring bioactive extracts or single compounds thereof that are believed beneficial to human health have produced an important and dynamic new extent of research resulting in significant developments in nutritional familiarity the marine environment signifies a relatively untapped source of functional ingredients that can be useful to various aspects of food processing storage and fortification furthermore in this text several marine based compounds have been recognised as having varied biological activities with some reported to interfere with the pathogenesis of diseases

## Handbook of Microalgal Culture

2013-04-03

algae are some of the fastest growing organisms in the world with up to 90 of their weight made up from carbohydrate protein and oil as well as these macromolecules microalgae are also rich in other high value compounds such as vitamins pigments and biologically active compounds all these compounds can be extracted for use by the cosmetics pharmaceutical nutraceutical and food industries and the algae itself can be used for feeding of livestock in particular fish where on going research is dedicated to increasing the percentage of fish and shellfish feed not derived from fish meal microalgae are also applied to wastewater bioremediation and carbon capture from industrial flue gases and can be used as organic fertilizer so far only a few species of microalgae including cyanobacteria are under mass cultivation the potential for expansion is enormous considering the existing hundreds of thousands of species and subspecies in which a large gene pool offers a significant potential for many new producers completely revised updated and expanded and with the inclusion of new editor qiang hu of arizona state university the second edition of this extremely important book contains 37 chapters nineteen of these chapters are written by new authors introducing many advanced and emerging technologies and applications such as novel photobioreactors mass cultivation of oil bearing microalgae for biofuels exploration of naturally occurring and genetically engineered microalgae as cell factories for high value chemicals and techno economic analysis of microalgal mass culture this excellent new edition also contains

details of the biology and large scale culture of several economically important and newly exploited microalgae including botryococcus chlamydomonas nannochloropsis nostoc chlorella spirulina haematococcus and dunaniella species strains edited by amos richmond and qiang hu each with a huge wealth of experience in microalgae its culture and biotechnology and drawing together contributions from experts around the globe this thorough and comprehensive new edition is an essential purchase for all those involved with microalgae their culture processing and use biotechnologists bioengineers phycologists pharmaceutical biofuel and fish feed industry personnel and biological scientists and students will all find a vast amount of cutting edge information within this second edition libraries in all universities where biological sciences biotechnology and aquaculture are studied and taught should all have copies of this landmark new edition on their shelves

## Handbook of Algal Technologies and Phytochemicals

2019-07-12

key features the most comprehensive resource available on the biodiversity of algal species their industrial production processes and their use for human consumption in food health and varied applications emphasis on basic and applied research addressing aspects of scale up for commercial exploitation for the development of novel phytochemicals phytochemicals from algae addresses the underexplored and underutilized potential of chemicals from marine sources for health benefits each chapter written by expert contributors from around the world includes a dictionary of terms key facts summary points figures and tables as well as up to date references the second book in this two volume set explores phycoremedation applications and the sustainable use of algae for biofuels and other products of economic value it also looks at aspects such as macro and micro algal impact on marine ecosystem and remote sensing of algal blooms the commercial value of chemicals of value to food and health is about 6 billion annually of which 30 percent relates to micro and macro algal metabolites and products for health food applications as a whole the two volumes explore the aspects of diversity of micro and macro algal forms their traditional uses their constituents which are of value for food feed specialty chemicals bioactive compounds for novel applications and bioenergy molecules bio business and the market share of algae based products are also dealt with providing

global perspectives

## Analysis of Marine Samples in Search of Bioactive Compounds

2014-08-26

seas and oceans offer a wide range of temperature pressure light and chemical conditions thus allowing a wide diversity of marine organisms from shallow coastal waters to the deep ocean these resources can be used to obtain new products and develop services and in turn help to provide solutions to the challenges that affect our planet including offering a sustainable supply of food and energy new industrial materials and processes new bioactive compounds and new health treatments marine compounds have been identified as having antibacterial anticoagulant antifungal antimalarial antiprotozoal antituberculosis and antiviral activities the major sources of these bioactive compounds are marine sponges coelenterates and microorganisms followed by algae echinoderms tunicates molluscs and bryozoans the discovery of bioactive compounds from marine samples is a hot topic considering the current need for sustainable use of marine resources this book is a comprehensive overview of the analytical techniques employed in the discovery and characterization of bioactive compounds isolated from all possible marine samples and gives future perspectives of analytical methodologies this overview includes an assessment of the sampling and preparation of extracts the separation and isolation of bioactive compounds their structural characterization and the application of bioassays in the discovery of bioactive compounds comprehensive coverage of analytical techniques and applications clear diagrams to adequately support important topics real examples of applications of analytical techniques in the search for new bioactive compounds

## Cultured Microalgae for the Food Industry

2021-05-12

cultured microalgae for the food industry current and potential applications is a comprehensive reference that addresses the current applications and potential uses of microalgae and microalgae derived compounds in the food industry the book explores the different steps of the subject from strain selection and cultivation steps to the assessment of the public perception of microalgae consumption and the gastronomical potential of this innovative resource readers will find coverage of microalgae biology common and uncommon algae species cultivation strategies for food applications novel extraction techniques safety issues regulatory issues and current market opportunities and challenges this title also explores the gastronomic potential of microalgae and reviews current commercialized products along with consumer attitudes surrounding microalgae covering relevant up to date research as assembled by a group of contributors who are experts in their respective fields the book is an essential reading for advanced undergraduates postgraduates and researchers in the microbiology biotechnology food science and technology fields thoroughly explores the optimization cultivation and extraction processes for increased bioactive compound yields includes industrial functionality bio accessibility and the bioavailability of the main compounds obtained from microalgae presents novel trends and the gastronomic potential of microalgae utilization in the food industry

## Algal Biology and Biotechnology

2009

in the recent past many advances have been made in the field of biology and biotechnology of algae especially microalgae this book includes chapters on taxonomy diversity and physiology of blue green algae as these organisms are most important from biotechnological point of view use of algae as biofertilizer source of natural colours bioactive compounds phytochemicals with pharmaceutical and biotechnological applications food and feed has been discussed environmental pollution is the major problem all over the world the potential of algae in combating water pollution is also highlighted depleting fossil fuel is another concern and it is felt that there is a need for alternative renewable resources algae as a potential source of biofuel are also discussed in this book

## Prospects and Challenges in Algal Biotechnology

2017-11-08

this contributed volume presents the latest research and state of the art approaches in the study of microalgae it describes in detail technologies for the cultivation of marine freshwater and extremophilic algae as well as phototrophic biofilms cyanobacterial mats and periphytons including the media requirements and growth rates of different types of algae the second part of the book is dedicated to the biotechnological applications of algal biomass and secondary metabolites produced by these organisms and critically discusses topics such as algae based biofuels and co2 sequestration in addition it reviews the prospects and challenges of algal bioremediation of domestic and industrial wastewaters including the use of planktonic and self immobilized algae systems in wastewater treatment explaining their merits and drawbacks lastly it highlights research methods and approaches related to the production of high value products and bioactive compounds

## Algae

2022-12-13

a single source reference on the biology of algae the third edition of algae anatomy biochemistry and biotechnology examines the most important taxa and structures for freshwater marine and terrestrial forms of algae its comprehensive coverage goes from algae s historical role through its taxonomy and ecology to its natural product possibilities in this update the authors have gathered a significant amount of new material including more information on macroalgae detailed description of biotic associations updated description of biomass cultivation systems coverage of different omic approaches and tools used in algal investigation an expanded and updated algae utilization chapter the book s unifying theme is the important role of algae in the earth s self regulating life support system and its function within restorative models of planetary health it also discusses algae s biotechnological applications

including potential nutritional and pharmaceutical products written for students as well as researchers teachers and professionals in the field of phycology and applied phycology this new full color edition is both illuminating and inspiring

## *Marine Algae in Pharmaceutical Science*

1979

algae organisms for imminent biotechnology will be useful source of information on basic and applied aspects of algae for post graduate students researchers scientists agriculturists and decision makers the book comprises a total of 12 chapters covering various aspects of algae particularly on microalgal biotechnology bloom dynamics photobioreactor design and operation of microalgal mass cultivation algae used as indicator of water quality microalgal biosensors for ecological monitoring in aquatic environment carbon capture and storage by microalgae to enhancing co2 removal synthesis and biotechnological potentials of algal nanoparticles biofilms silica based nanovectors challenges and opportunities in marine algae and genetic identification and mass propagation of economically important seaweeds and seaweeds as source of new bioactive prototypes

## *Algae*

2016-06-29

seaweeds around the world state of art and perspectives volume 95 includes discussions on current research conducted in the field of algae specific chapters cover isotopic labeling of cultured macroalgae and isolation of 13c labeled cell wall polysaccharides for trophic investigations selected red seaweeds from the philippines with emerging high value applications challenges to the future domestication of seaweed cultivated species understanding individual needs and physiological processes for large scale production the importance of mucilage in dispersion and efficiency of fertilization of male gametes the application of seaweeds in environmental biotechnology indonesian sargassum species prospecting potential applications of bioactive

compounds and much more presents the most recent biological knowledge and advances on seaweed content covers innovations to biotechnological aquacultural and chemical developments about seaweeds field written by the most experienced authors in the field

## Seaweeds Around the World: State of Art and Perspectives

2020-04-09

in this book researchers and practitioners working in the field present the major promises of algae biotechnology and they critically discuss the challenges arising from applications based on this assessment the authors explore the great scientific industrial and economic potential opened up by algae biotechnology the first part of the book presents recent developments in key enabling technologies which are the driving force to unleash the enormous potential of algae biotechnology the second part of the book focuses on how practical applications of algae biotechnology may provide new solutions to some of the grand challenges of the 21st century algae offer great potential to support the building of a bio based economy and they can contribute new solutions to some of the grand challenges of the 21st century despite significant progress algae biotechnology is yet far from fulfilling its potential how to unleash this enormous potential is the challenge that the own field is facing new cultivation technologies and bioprocess engineering allow for optimization of the operation strategy of state of the art industrial scale production systems and they reduce the production costs parallel to this new molecular technologies for genetic and metabolic engineering of micro algae develop quickly the optimization of existing biochemical pathways or the introduction of pathway components makes high yield production of specific metabolites possible novel screening technologies including high throughput technologies enables testing of extremely large numbers of samples and thus allow for large scale modelling of biomolecular processes which would have not been possible in the past moreover profitable production can demand for integrated biorefining which combines consecutive processes and various feedstocks to produce both transportation fuel electric energy and valuable chemicals

## Grand Challenges in Algae Biotechnology

2020-01-02

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 Marine Macroalgae

2011-11-04

this special issue presents high quality research papers as well as review articles addressing recent advances in the use of marine bioactives in animal nutrition the marine environment constitutes a relatively untapped source of biologically active compounds that can be applied in various areas such as improvement of animal performance health maintenance and disease prevention numerous marine based compounds isolated from marine organisms especially seaweeds have diverse biological activities including antioxidative anti inflammatory antibacterial antifungal and antiviral activities that can be beneficial to animal health additionally the application of marine bioactives as feed additives can increase the nutritional value of products of animal origin in this special issue the main attention was focused on seaweeds and their application in poultry laying hen and broiler chickens and pig feed the suitable processing of marine resources required for their optimal use as feed feed additives was underlined the contained publications present scientific evidence for the use of various seaweeds as feed additives that improve health enhanced immunity prebiotic effect growth performance and production

inclusion of this unconventional material in animal nutrition can enrich products with active compounds such as micro and macroelements polyunsaturated fatty acids and pigments which are beneficial for consumers

## Marine Biologically Active Compounds as Feed Additives

2020-11-13

the marine environment covers 70 of the earth s surface and accounts for 98 of the potentially habitable space the bioactives from marine microorganisms include antibiotic compounds polysaccharides inhibitors enzymes peptides and pigments these are used in various fields of biology that range from nutraceuticals to cosmeceuticals recent scientific investigations have revealed that marine microbial compounds exhibit various beneficial biological effects such as anti inflammatory anti cancer anti hiv anti hypertensive and anti diabetic marine microorganisms extraction and analysis of bioactive compounds sheds light on the extraction clean up and detection methods of major compounds from marine organisms the book includes information on the different classes of marine microorganisms and the different bioactives that can be extracted from bacteria fungi and microalgae divided into 7 chapters the book covers bioactive marine natural products such as marine microbes seaweeds and marine sponges as potential sources of drug discovery and focuses on analysis methods of the biocomponents from marine microorganisms a useful reference tool for researchers and students this book provides current knowledge about isolation and analysis methods of the bioactives and provides insight into the various bioactives of marine microbes toward nutraceutical and pharmaceutical development

## Marine Microorganisms

2016-09-19

this two volume work presents comprehensive accurate information on the present status and contemporary development in phycoremediation of various

types of domestic and industrial wastewaters the volume covers a mechanistic understanding of microalgae based treatment of wastewaters including current challenges in the treatment of various organic and inorganic pollutants and future opportunities of bioremediation of wastewater and industrial effluents on an algal platform the editors compile the work of authors from around the globe providing insight on key issues and state of the art developments in algal bioremediation that is missing from the currently available body of literature the volume hopes to serve as a much needed resource for professors researchers and scientists interested in microalgae applications for wastewater treatment volume 1 focuses on the different aspects of domestic and industrial wastewater treatment by microalgae the case studies include examples such as genetic technologies as well as the development and efficient use of designer consortia for enhanced utilization of microalgae this volume provides thorough and comprehensive information on removal of persistent and highly toxic contaminants such as heavy metals organic pesticides polyaromatic hydrocarbons endocrine disruptors pharmaceutical compounds and dyes from wastewater by microalgae diatoms and blue green algae design considerations for algal ponds and efficient use of photobioreactors and hraps for wastewater treatment are some other highlights this volume addresses the applications potentials and future opportunities for these various considerations in water pollution mitigation using algal technologies

## Application of Microalgae in Wastewater Treatment

2019-05-23

algae for food cultivation processing and nutritional benefits algae are a primitive living photosynthetic form and they are the oldest living organism in the marine ecosystem algae are the primary producers that supply energy required to a diverse marine organism and especially seaweed provides a habitat for invertebrates and fishes there have been significant advances in many areas of phycology this book describes the advances related to food and nutrition of algae achieved during the last decades it also identifies gaps in the present knowledge and needs for the future the 17 chapters grouped into 6 parts are written by phycologists more insight on industrial exploitation of algae and their products is supported by current studies and will help academia the first part explains new technologies to improve the microalgal biomass strain improvement and different methods of seaweed cultivation in

the second part food and nutraceutical applications of algae food safety aspects green nanotechnology and formulation methods for the extraction and isolation of algal functional foods are described the third part deals with pigments and carotenoids while the fourth part exploits the isolation and application of hydrocolloids nutritional implications of algal polysaccharides and the characterization and bioactivity of fucoidans in the fifth part the biomedical potential of seaweed followed by agricultural applications of algae are well described the book is an important resource for scholars that provides knowledge on wide range of topics key features covers important fields of algae from biomass production to genetic engineering aspects of algae useful in the field of algal biotechnology aquaculture marine micro and macrobiology microbial biotechnology and bioprocess technology focuses on the therapeutic and nutritional areas of algae

## *Algae for Food*

2021-10-25

part of the ift press series this book reviews the myriadpublished information on bioactive components derived from marinefoods enabling researchers and product developers to selectappropriate functional ingredients for new products chapters cover foods and food ingredients from both animal andplant marine sources focusing on those which demonstratebiological properties and whose constituent compounds have beenisolated and identified as potentially active this book furtheraddresses the biological activities of pufas polyunsaturated fattyacids oils phospholipids proteins and peptides fibres carbohydrates chitosans vitamins and minerals fucoxantin polyphenols phytosterols taurine amongst others thesecomponents found in a variety of marine derived foods have beendemonstrated to have preventative properties with regard tohypertension oxidative stress inflammation cardiovasculardiseases cancer and other human diseases extraction methods and analysis techniques are also addressed intended for food scientists food technologists and food engineersin academia industry and government this book reviews thesubstantial quantity of current research in this fast moving andcommercially valuable sector of food and nutrition science

# Bioactive Compounds from Marine Foods

2013-09-30

algae are an important group of organisms which are found in a wide range of habitats be it oceans rivers fresh water lakes ponds or brackish water bodies snow barks of the trees etc ranging from a small tiny cell to the giant kelp measuring up to several metres this group of plants have some unique features which are not found in any other group of organisms algae have both prokaryotic and eukaryotic groups large varieties of pigment systems triphasic life cycle and a long evolutionary history algae have also changed the planet s atmosphere by producing oxygen thus paving the way for evolution of life on earth these tiny organisms not only give us oxygen to breathe food to eat medicines to heal and cosmetics to use but they also provide a lot of information about the origin of life it has been predicted that not only vehicles will run on algal biofuels in the future but power plants will use algae for carbon dioxide sequestration despite its huge importance algae remains a much neglected subject because of its stereotype boring class room table materials as pond scum globally algae is already a multi billion dollar industry employing large numbers of people in various industries and their value is set to increase in future therefore the purpose of writing and editing this book is not to publish one more text book in the field of phycology but to give an alternative outlook and encouragement to our readers and students to understand feel and unravel the beauty and use of this group of organisms in many different ways the 22 chapters are divided into two different parts which have been authored by eminent researchers from across the world the first part biology of algae contains 10 chapters dealing with the general characteristics classification and description of different groups such as blue green algae green algae brown algae red algae diatoms xanthophyceae dinophyceae etc in addition it has two important chapters covering algae in extreme environments and life histories and growth forms in green algae the second part applied phycology contains 12 chapters dealing with the more applied aspects ranging from algal biotechnology biofuel phycoremediation bioactive compounds biofertilizer fatty acids harmful algal blooms industrial applications of seaweeds nanotechnology phylogenomics and algal culture techniques etc this volume has been carefully written and edited with an interdisciplinary appeal and aims to bring all aspects of algae together in one volume

## *The Algae World*

2015

algae have been used since ancient times as food fodder fertilizer and as source of medicine nowadays seaweeds represent an unlimited source of the raw materials used in pharmaceutical food industries medicine and cosmetics they are nutritionally valuable as fresh or dried vegetables or as ingredients in a wide variety of prepared foods in particular seaweeds contain significant quantities of protein lipids minerals and vitamins there is limited information about the role of algae and algal metabolites in medicine only a few taxa have been studied for their use in medicine many traditional cultures report curative powers from selected alga in particular tropical and subtropical marine forms this is especially true in the maritime areas of asia where the sea plays a significant role in daily activities nonetheless at present only a few genera and species of algae are involved in aspects of medicine and therapy beneficial uses of algae or algal products include those that may mimic specific manifestations of human diseases production of antibiotic compounds or improvement of human nutrition in obstetrics dental research thallassotherapy and forensic medicine

## Therapeutic and Nutritional Uses of Algae

2018-01-29

the author presents a state of the art account of research in algal production and utilization dr becker provides a compilation of the different methods employed worldwide for the artificial cultivation of different microalgae including recipes for culture media description of outdoor and indoor cultivation systems as well as harvesting and procesing methods the book will be essential reading for advanced undergraduates postgraduates and researchers in the field

## Marine Bioactive Compounds

2011-11-19

## Microalgae

1994

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