

bioactive phytochemicals, medicinal properties of herbs and spices, synergy in whole-plant medicine, potential applications of polyphenols from herbs and spices in dairy products, biotic and abiotic safety concerns, and adverse human health effects and regulation of metal contaminants in terrestrial plant-derived food and phytopharmaceuticals. Covers the emerging health benefits of herbs and spices, including their use as anti-diabetics, anti-inflammatory, and anti-oxidants Reviews the effect of classical and novel processing techniques on the properties of herbs and spices Features informed perspectives from noted academics and professionals in the industry Part of Wiley's new IFST Advances in Food Science series Herbs, Spices and Medicinal Plants is an important book for companies, research institutions, and universities active in the areas of food processing and the agri-food environment. It will appeal to food scientists and engineers, environmentalists, and food regulatory agencies.

Natural bioactive compounds from medicinal plants are inexplicably diverse in chemical structure and biological properties. The unmet therapeutic requirements for various diseases serve as a guide for researchers to study natural compounds. These studies are intended to isolate, identify the structural characterization and eventually discover the pharmacological activity of natural compounds from their plant sources with the goal of treating specific diseases. Bioactive Phytochemicals: Drug Discovery to Product Development explores the scope and approaches of drug discovery from natural products. Chapters in the book cover information about the cultivation, collection and processing of medicinal plants, the methods and high throughput techniques for isolation and characterization of bioactive phytochemicals and pharmacological screening for activity, formulation and quality control. Information about the regulations specified for natural medicinal products in different region of the world is also presented, followed by a concluding chapter devoted to the role of natural herbal products for treatment of human diseases such as cancer, cardiovascular diseases, diabetes, obesity, inflammation and neurological disorders. Each chapter concludes with a general reference section, which is a bibliographic guide to more advanced texts. The contributing authors for this volume are drawn from a rich blend of experts in various areas of herbal medicine which encompass herbal drug discovery to product development. The concise and organized layout along with a broad coverage of phytochemistry and drug discovery makes this book a suitable reference for students of medicinal chemistry, researchers and industry professionals interested in herbal product development.

These are just a few examples that illustrate the chemical diversity and use of phenolic compounds, the topic of 'Phenolic Compound Biochemistry'. This book is written for researchers, instructors, advanced undergraduate students and beginning graduate students in the life sciences who wish to become more familiar with these and many other intriguing aspects of phenolic compounds. Topics covered include nomenclature, chemical properties, biosynthesis, including an up-to-date overview of the genetics controlling phenolic metabolism, isolation and characterization of phenolic compounds, phenolics used in plant defense, and the impact of phenolics on human health. The book is written in an accessible style, and assumes only basic knowledge of organic chemistry, biochemistry and cell physiology. More than 300 chemical structures and reaction schemes illustrate the text. Wilfred Vermerris is Associate Professor of Agronomy at the University of Florida Genetics Institute in Gainesville, FL. His research focuses on the genetic control of phenolic compounds that impact agro-industrial processing of crop plants. Ralph Nicholson is Professor of Botany and Plant Pathology at Purdue University in West Lafayette, IN. He is an expert on phenolic compounds involved in the plant's defense against pathogenic fungi and bacteria.

Microwave-assisted Extraction for Bioactive Compounds

Metabolomics Tools for Natural Product Discovery

Bioactive Compounds From Plants

Ingredients Extraction by Physico-Chemical Methods in Food

From Plants to Drug Development

Medicinal Plants and Natural Product Research

Herbs, Spices and Medicinal Plants

Water Extraction of Bioactive Compounds: From Plants to Drug Development draws together the expert knowledge of researchers from around the world to outline the essential knowledge and techniques required to successfully extract bioactive compounds for further study. The book is a practical tool for medicinal chemists, biochemists, pharmaceutical scientists and academics working in the discovery and development of drugs from natural sources. The discovery and extraction of bioactive plant compounds from natural sources is of growing interest to drug developers, adding greater fuel to a simultaneous search for efficient, green technologies to support this. Particularly promising are aqueous based methods, as water is a cheap, safe and abundant solvent. The book is a detailed guide to the fundamental concepts and necessary equipment needed to successfully undertake such processes, supported by application examples and highlighting the most influential variables. Part 1 begins with a thorough introduction to plants as sources of drugs, highlighting strategies for the discovery of novel bioactive constituents of botanicals, the need for standardization and a move toward more rational and greener techniques in the field, the development of plant-based extraction processes and pretreatments for the efficient extraction. Part 2 then reviews a broad range of available techniques, including sections on conventional hot water extraction and pressurized hot water extraction in a range of settings. Intensified processes are then discussed in detail, including sections on microwave-assisted processes, ultrasound-assisted processes and enzyme assisted extraction. Covers the theoretical background and range of techniques available to researchers, helping them to select the most appropriate extraction method for their needs Presents up-to-date and cutting edge applications by international experts Highlights current use and future potential for industrial scale applications Offers a thorough introduction to plants as sources of drugs, highlighting strategies for the discovery of novel bioactive constituents of botanicals

The aim of this book to describe the extraction of phenolic compounds from different extracts of medicinal plants by using different extraction techniques and quantification methods. The phenolic compounds are well known phytochemicals found in all plants and these are responsible for antioxidant activity. Phenolic compounds are classified as simple phenols or poly phenols based on the number of phenol units in the molecule. Bio Chemical methods are used to detect the presences of phenol while different techniques like soxhlet extraction, micro wave-assisted extraction, and ultra sound-assisted extraction and quantification methods like spectrophotometric, high pressure liquid chromatography, gas chromatography methodologies are utilized in plant based products.

Ingredients Extraction by Physico-chemical Methods, Volume Four, the latest release in the Handbook of Food Bioengineering series, reveals the most investigated extraction methods of ingredients and their impact on the food industry. This resource describes types of ingredients that may be extracted through physico-chemical methods (i.e. specific plants, fruits, spices, etc.), along with their particularities to help readers understand their biological effect and solve research problems. The extraction methods of bioactive compounds and functional ingredients are discussed, along with information on green ingredient extraction strategies to help reduce harmful environmental and health effects. Extraction methods in this book can be applied for multiple purposes within the food industry, such as ingredients separation for food development, the purification and separation of toxic compounds from a food mixture, and the recovery of natural bioactive compounds. Offers advanced knowledge and skills of physiochemical analysis for ingredient extraction Presents various methods for food component analysis to evaluate structure function relations in changing environments Discusses the importance of enzymes during processing and storage of foods Includes methods to evaluate and enhance extraction, such as ultrasound, to produce novel foods more efficiently

Ethnobiology and ethnoecology have become very popular in recent years. Particularly in the last 20 years, many manuals of methods have published the most classical approaches to the subject. There have been, however, many advances in research as a result of interaction with different disciplines, but also due to more recent results, new original and interesting questions. This handbook provides the current state of the art methods and techniques in ethnobiology and ethnoecology, and related fields. This new volume, besides bringing new and original aspects of what is found in the literature, fills some of the gaps in volume one by including the most systematic and extensive treatment of methods and techniques in qualitative research. Along with the various methods covered in the individual chapters, the handbook also includes an extensive bibliography that details the current literature in the field.

Green Technologies for Extraction of Egyptian Medicinal Plants

Herbal Bioactives and Food Fortification

Water Extraction of Bioactive Compounds

Back to Nature

Essentials of Botanical Extraction

Plant Extracts: Applications in the Food Industry

Phenolic compounds are considered secondary metabolites within the physiology of a plant. They have different functions, such as pollination systems, sun protection, protection against pathogens and diseases, etc.Research on these compounds has increased the number of molecules they can include and the different biological activities they demonstrate. It is important to know the methods of extracting molecules, the biosynthesis routes, and their relationship with activities that can benefit from their consumption. This book includes chapters that provide information on extraction and optimization techniques, biosynthetic pathways, and the identification and characterization of miRNAs involved in the regulation of their biosynthesis.

Notoriously cumbersome to isolate and challenging to synthesize, the path of natural products to viable drugs is an arduous journey. Yet compounds isolated from nature may possess fascinating structures, biological profiles and pharmaceutical potential far beyond anything made by man. Natural Products Chemistry: Sources, Separations and Structures presents a practical guide to sourcing, isolating, and discovering new compounds from nature many of which become pharmaceutical drugs. This book emphasizes the advantages of products acquired from nature, compared to those obtained from combinatorial chemistry. A basic introduction, the book describes the whole cycle from farm to final compound, backed up by case studies drawn from industry and research applications. It broadens the scope of applications and draws upon examples from various sources. Natural products chemistry, as taught today, draws its examples mainly from marine chemistry or plant chemistry; however, there is also a fascinating and rich world of fermentation products (e.g. algal) products leading to complex structures. Thus, the book draws upon examples from the microbial world and from insects too. Therefore, this is a source of bioactive metabolites, not traditionally available in academic settings, more the mainstay of the pharmaceutical industry. Providing a roadmap of the process of collecting a compound from nature, isolating the active ingredient, and determining the chemical structure, this book provides a unique approach to the world of natural products.

A collection of test procedures for assessing the identity, purity, and content of medicinal plant materials, including determination of pesticide residues, arsenic and heavy metals. Intended to assist national laboratories engaged in drug quality control, the methods cover the growing use of medicinal plants, the special quality problems they pose, and the corresponding need for international guidance on reliable methods for quality control. Recommended procedures - whether involving visual inspection or the use of thin-layer chromatography - the qualitative determination of impurities - should also prove useful to the pharmaceutical industry and pharmacists working with these materials.

Nature has always been, and still is, a source of food and ingredients that are beneficial to human health. Nowadays, plant extracts are increasingly becoming important additives in the food industry due to their antimicrobial and antioxidant activities that do not mask the taste of off-flavors and improve the shelf life and color stability of food products. Due to their natural origin, they are excellent candidates to replace synthetic compounds, which are generally considered to have toxicological and carcinogenic effects. The efficient isolation of bioactive compounds from their natural sources and the determination of their activity in commercialized products have been great challenges for researchers and food chain contributors to develop products with positive effects on human health. The objective of this book is to highlight the existing evidence regarding the various potential benefits of the consumption of plant extracts and plant-extract-based products, with emphasis on in vivo works and epidemiological studies, the application of plant extracts to improving shelf life, and health-related properties of foods, and the extraction techniques that can be used to obtain bioactive compounds from plant extracts.

Drug Discovery to Product Development

Perspectives on Plant Secondary Products

Methods and Techniques in Ethnobiology and Ethnoecology

Natural Bio-active Compounds

A New East Asia

Natural Products Chemistry

Toward a Regional Community

Pengelly's user friendly text will encourage educators in medical science to consider using this material in the complementary medicine/nutraceuticals areas May I congratulate Andrew Pengelly for writing this text as it is going to be very popular with undergraduate students as well as more experienced readers. D. Green, London Metropolitan University, UK This unique book explains in simple terms the commonly occurring chemical constituents of medicinal plants. The major classes of plant constituents such as phenols, terpenes and polysaccharides, are described both in terms of their chemical structures and their pharmacological activities.

Identifying specific chemical compounds provides insights into traditional and clinical use of these herbs, as well as potential for adverse reactions. Features include: * Over 100 diagrams of chemical structures * References to original research studies and clinical trials * References to plants commonly used throughout Europe, North America and Australasia. Written by an experienced herbal practitioner, The Constituents of Medicinal Plants seriously challenges any suggestion that herbal medicine remains untested and unproven, including as it does hundreds of references to original research studies and trials. Designed as an undergraduate text, the first edition of this book became an essential desktop reference for health practitioners, lecturers, researchers, producers and anyone with an interest in how medicinal herbs work. This edition has been extensively revised to incorporate up-to-date research and additional sections, including an expanded introduction to plant molecular structures, and is destined to become a classic in the literature of herbal medicine. Useful throughout history for their medical as well as other benefits, plant-derived compounds have gained particular importance recently, due to environmental factors. The isolation and characterization of plant products, the identification of their role in the plant, and ways of synthesizing identical compounds or more potent analogues are covered. Also includes methods of culturing plant tissues and genetic engineering as a means of increasing the yield of desired substances from plants. Special emphasis is placed on plants previously unknown to Western scientists.

Essentials of Botanical Extraction: Principles and Applications provides a unique, single source of valuable information on the various botanical extraction methods available, from conventional to the use of green and modern extraction technologies including ultrasounds, microwaves, pressurized liquids, and supercritical fluids. Most extracts obtained from botanicals are often poorly characterized with unidentified active or inactive constituents. A wise selection of an extraction strategy is vital to drug discovery from medicinal plants as extraction forms the basic first step in medicinal plant research. This book also explores the mathematical hypotheses and innovations in botanical extractions and analyzes different post extraction operations so that dependency on serendipity is reduced and the same be converted into programmed drug discovery. Reviews the history and current state of natural product drug discovery and development, highlighting successes and current issues Explains the application of chemometric tools in extraction process design and method development Introduces process intensification as applied to the processing of medicinal plant extracts for rapid and cost-effective extraction

Extraction processes are essential steps in numerous industrial applications from perfume over pharmaceutical to fine chemical industry. Nowadays, there are three key aspects in industrial extraction processes: economy and quality, as well as environmental considerations. This book presents a complete picture of current knowledge on green extraction in terms of innovative processes, original methods, alternative solvents and safe products, and provides the necessary theoretical background as well as industrial application examples and environmental impacts. Each chapter is written by experts in the field and the strong focus on green chemistry throughout the book makes this book a unique reference source. This book is intended to be a first step towards a future cooperation in a new extraction of natural products, built to improve both fundamental and green parameters of the techniques and to increase the amount of extracts obtained from renewable resources with a minimum consumption of energy and solvents, and the maximum safety for operators and the environment.

Aromatic and Medicinal Plants

Phenolic Compound Biochemistry

Processing, Health Benefits and Safety

Natural Sources, Importance and Applications

Phenolic Compounds

Plant Extracts in Food Applications is the first book of its kind focusing on the application of plant extracts in the food industry. Topics cover sources, extraction and encapsulation techniques, the chemistry and stability of plant extracts, antimicrobials, preservatives, nutrient enrichment, coloring agents, packaging aid, health benefits, opportunities and the challenges surrounding the use of plant extracts in food applications. Written by several experts in the field, this book is a valuable resource for students, scientists, and professionals in food science, food chemistry, and food technology. potential risks regarding the use of synthetic chemicals have renewed the interests of consumers using natural and safe alternatives. Plant extracts represent an interesting ingredient, mainly due to their natural origin and phytochemical properties, allowing for obtaining active ingredients that add value to the product. Presents chapters that deal with different sources of plant extracts and their applications in the food industry Covers the various extraction procedures which are used for plant extracts Includes the health benefits and stability of plant extracts Provides information on life enhancement, packaging aid, and as flavoring and coloring agents

While there are many books available on methods of organic and biochemical analysis, the majority are either primarily concerned with the application of a particular technique (e.g. paper chromatography) or have been written for an audience of chemists or for biochemists working in a particular field. Thus, no simple guide to modern methods of plant analysis exists and the purpose of the present volume is to fill this gap. It is primarily intended for students in the plant sciences, who have a botanical or a general biological background. It should also be of value to students in the field of food science and 'natural products' organic chemistry. Most books on chromatography, while admirably covering the needs of research workers, tend to overwhelm the student with long lists of solvent systems and spray reagents that can be applied to each class of organic compound. This book simplifies the situation by listing only a few specially recommended techniques that have wide currency in phytochemical laboratories. Sufficient details are provided to allow the student to use the techniques for themselves and most sections contain some introductory practical examples and a classification of the compounds concerned in each classwork.

This book is principally concerned with the relatively complex small molecules produced by plants, which are important as drugs, fine chemicals, fragrances, flavours and biologically-active dietary constituents. In a wide-ranging series of thematic essays, it covers key aspects of plant metabolism in the plant, their discovery, characterisation and use and their significance in the diet. Biotechnology, including prospects for the genetic engineering of metabolic pathways, for biotransformations and also for the production of biologically-active proteins, is the focus of several chapters. The overall aim of the volume is to provide, in each of the selected subject areas, a personal critique which is readily accessible to the advanced undergraduate student and to the non-specialist research worker alike. Contents:Classes and Functions of Secondary Products from Plants;Harborne)Characterisation and Control of Plant Secondary Metabolism (N J Walton et al.)Modern Methods of Secondary Product Isolation and Analysis (T A van Beek)Structure Elucidation of Plant Secondary Products (G Massiot et al.)Plant Drug Discovery and Development (M S Grayer)Disease Prevention and Plant Dietary Substances (G Williamson et al.)Biotransformations (M C R Franssen & N J Walton)Production of Biologically-Active Proteins in Plants (G P Lomonossoff)Biotechnology and Plant Secondary Products: The Future (V De Luca) Readership: Undergraduates and research workers in plant science, botany, biochemistry, pharmacy and biotechnology. keywords:Plants;Biochemistry;Metabolism;Natural Products;Phytochemicals;Analytical Chemistry;Drugs;Pharmacy;Pharmacognosy;Diet;Biotechnology;Molecular Biology;Secondary Products;Plant Secondary Products;Plant Drug Discovery;Biotransformation;Biologically Active Plant Compounds;Disease Prevention;Plant Dietary Substances;Anti-Oxidants;Nutraceuticals;Analytical Methods;Bio-Active Metabolites;Pharmaceuticals;Metabolic Pathways;Regulation;Structure-Activity Relationships

the compilation covers a wide range of topics, and might make a good graduate-level text, or a nice addition to a personal or faculty library." Plant Science Bulletin