Total Phenolic Total Flavonoid Tannin Content And

Plant endophytes are a potential source for the production of bioactive compounds that can fight against devastating diseases in both plants and humans. Among these endophytic microorganisms, endophytic fungi are one of the dominant group of microorganisms with a potential role in plant growth promotion and the discovery of noble bioactive natural products. Endophytic fungi possess several bioactivities like anticancer, antimicrobial, insecticidal, plant growth stimulants, crop protection, phytoremediation, etc. Presence of modular biosynthetic genes clusters like PKS and NRPS in several endophytic fungi underscores the need to understand and explore such organisms. This volume presents and demonstrates the applied aspects of endophytic fungi. Practical applications of such endophytes are discussed in detail, including studies in pharmaceutical development and agricultural management of important microbial diseases. The beneficial effects that endophytic fungi provide to host plants—enhancing growth, increasing fitness, strengthening tolerance to abiotic and biotic stresses through secondary metabolites—are also discussed. The reader is provided with a comprehensive and detailed understanding of such relationships between endophytic fungi and their host.

This book presents the wisdom, knowledge and expertise of the food industry that ensures the supply of food to maintain the health, comfort, and wellbeing of humankind. The global food industry has the largest market: the world population of seven billion people. The book pioneers life-saving innovations and assists in the fight against world hunger and food shortages that threaten human essentials such as water and energy supply. Floods, droughts, fires, storms, climate change, global warming and greenhouse gas emissions can be devastating, altering the environment and, ultimately, the production of foods. Experts from industry and academia, as well as food producers, designers of food processing equipment, and corrosion practitioners have written special chapters for this rich compendium based on their encyclopedic knowledge and practical experience. This is a multi-authored book. The writers, who come from diverse areas of food science and technology, enrich this volume by presenting different approaches and orientations.

Phenolic compounds as a large class of metabolites found in plants have attracted attention since long time ago due to their properties and the hope that they will show beneficial health effects when taken as dietary supplements. This book presents the state of the art of some of the natural sources of phenolic compounds, for example, medicinal plants, grapes or blue maize, as well as the modern methods of extraction, quantification, and identification, and there is a special section discussing the treatment, removal, and degradation of phenols, an important issue in those phenols derived from the pharmaceutical or petrochemical industries.

Plant extracts are widely used for therapeutic purposes. The vegetal origin of

these products satisfies people's desire to cure themselves with natural drugs; this aspect, together with effectiveness and regulatory opportunities, is the base of the broad modern use of medicinal plants. Traditional uses and novel biological effects allow the availability of an extraordinarily high number of different compounds with formidable therapeutic potential. Nevertheless, pitfalls are hidden behind poor pharmacological and toxicological knowledge of plant extracts, nonstandardized methods of extraction, and undefined and nonrepeatable qualitative and quantitative composition. In this context, novel experimental studies on plant products and appreciated and are necessary to reinforce the scientific soundness of phytotherapy. This book aims to respond to this medical need comprehensively highlighting the newest discoveries in vegetal resources with an emphasis on pharmacological activity.

Wine Science, Third Edition, covers the three pillars of wine science – grape culture, wine production, and sensory evaluation. It takes readers on a scientific tour into the world of wine by detailing the latest discoveries in this exciting industry. From grape anatomy to wine and health, this book includes coverage of material not found in other enology or viticulture texts including details on cork and oak, specialized wine making procedures, and historical origins of procedures. Author Ronald Jackson uniquely breaks down sophisticated techniques, allowing the reader to easily understand wine science processes. This updated edition covers the chemistry of red wine color, origin of grape varietyies, wine language, significance of color and other biasing factors to wine perception, various meanings and significance of wine oxidation. It includes significant additional coverage on brandy and ice wine production as well as new illustrations and color photos. This book is recommended for grape growers, fermentation technologists; students of enology and viticulture, enologists, and viticulturalists. NEW to this edition: * Extensive revision and additions on: chemistry of red wine color, origin of grape varietyies, wine language, significance of color and other biasing factors to wine perception, various meanings and significance of wine oxidation * Significant additional coverage on brandy and ice wine production * New illustrations and color photos

For thousands of years mint has enjoyed an honored place in pharmacopoeias and kitchen cupboards in India, China, Europe, North America, and elsewhere. Today the amount of essential oils produced from the four major mint species (cornmint, peppermint, Native spearmint, and Scotch spearmint) exceeds 23,000 metric tonnes annually with a market value

Teucrium species are an intersting object of research in the various aspects of science with multiple applications. With more than 300 species, Teucrium is one of the largest and well distributed genera of the Lamiaceae family. Known medicinal Teucrium species have a long traditional use as well as different potential applications in pharmacy, food and beverage industry. Teucrium species are very rich in a variety of secondary metabolites with significant biological activities. Based on that, the book contains 15 chapters which

discusses recent advances in exploring the unique features of Teucrium species including morphology, systematics, taxonomy, biogeography, ethnobotany, phytochemistry, biological activity such as genotoxic, antioxidant, antibacterial, antifungal, antiviral, anticancer, anticholinesterase, antidiabetic and anti-inflammatory activity of secondary metabolites as well as applications including current challenges and further perspectives. Some medicinal Teucrium species in excessive use can cause certain consequences. This phenomenon and precaution is also described. Whilst this book is primarily aimed at scientists, researchers, beginners in the investigations of Teucrium species, graduate and post-graduate students in biology, botany, biotechnology, agriculture, and pharmacy, as well as science enthusiasts and practitioners involved in medicinal plants applications. Book provides complete Teucrium species list, color photographs of selected Teucrium species on natural habitats, as well as up-to-date bibliography related to Teucrium genus.

Bioactive compounds are abundant in nature, particularly in plants, which have the capacity to synthesize phenolics, flavonoids, caffeine, carotenoids, and much more. Different bioactive compounds can change or alter the life process due to their different biological activities. This book examines bioactive compounds and their sources, structures, and potential uses in various industries, including pharmaceuticals, medicine, cosmetics, and food processing.

About 1958, the late Professor R. E. ALSTON and Professor B. L. TURNER, both of the Department ofBotany, The University ofTexas at Austin, initiated a general systematic investigation ofthe legurne genus Baptisia. They found that flavonoid patterns, as revealed by two-dimensional paper chromatography, were valid criteria for the recognition of the Baptisia species and for the documentation of their numerous natural hybrids. Later, they showed that the flavonoid chemistry could be used for the analysis of gene flow among populations. At that time no attempt was made to even partially identify the flavonoids which were detected chromatographically. Neverthe1ess, it soon became apparent that the full value of the chemical data for systematic purposes required knowledge of the structures of the flavonoids. In 1962, one of us (T.J.M.) in collaboration with Drs. ALSTON and TURNER beg an the chemical analysis of the more than 60 flavonoids which had been chromatographi cally detected in the 16 Baptisia species. In the intervening years, a number of chemists and botanists, inc1uding Drs. K. BAETCKE, B. BREHM, M. CRANMER, D. HORNE, J. KAGAN, B. KROSCHEWSKY, J. MCCLURE, H. RÖSLER, and J. WALLACE, participated in the devel opment of techniques and procedures for the rapid identification of known flavonoids and in the structure determination of new flavonoids. In addition, the flavonoid chem istry of many plants other than Baptisia was investigated.

Seaweeds are recognized as highly nutritious, and their use in gastronomy is increasing. Their health benefits and their potential to prevent several diseases have also been established. In this Special Issue several health effects are discussed, with more emphasis on their antitumor activity and potential use to treat Alzheimer's disease. The key bioactive metabolites, from which phlorotannins can be highlighted, are presented, as well as some important in vivo studies. Altogether, the chapters

provide in-depth information about the biological activities of seaweed metabolites, contributing to elucidate the health effects of seaweed.

This work responds to the need to find, in a sole document, the affect of oxidative stress at different levels, as well as treatment with antioxidants to revert and diminish the damage. Oxidative Stress and Chronic Degenerative Diseases - a Role for Antioxidants is written for health professionals by researchers at diverse educative institutions (Mexico, Brazil, USA, Spain, Australia, and Slovenia). I would like to underscore that of the 19 chapters, 14 are by Mexican researchers, which demonstrates the commitment of Mexican institutions to academic life and to the prevention and treatment of chronic degenerative diseases.

Enlarged edition of: Fruit and vegetable phytochemicals: chemistry, nutritional value and stability / [editors] Laura A. de la Rosa, Emilio Alvarez-Parrilla, Gustavo A. Gonzaalez-Aguilar. Ames,, Iowa: Wiley-Blackwell, 2010

Polyphenols are plant non-nutrient natural products, or plant secondary metabolites, found in fruits, vegetables and seeds that we consume daily. Their intakes from fruit, vegetables, seeds, and nuts are associated with lower risks of chronic and age-related degenerative diseases. Aging is a dynamic and complex biological process involving multiple actors and subject to a number of genetic and/or environmental influences. The famous free radical theory of aging proposed by Prof. Harman in 1956 states that free radicals lead to oxidative damage, causing cellular dysfunction and physiological decline, and are responsible for aging, with the appearance of degenerative diseases and eventually death. From this hypothesis, antioxidant molecules are capable of slowing down the aging process through the successful scavenging of radical oxygen and nitrogen species. Polyphenols have been shown to prolong the lifespan of different model species operating through a well-conserved antioxidant mechanism. This collection of research and review articles covers the most recent advances in the use of plant polyphenols, ranging from their biological properties and possible functions as medicines, the importance of traditional medicines as a source of inspiration, the rationalization of new uses of plant extracts which lead to applications in modern medicine, the status of modern green-chemistry extraction methods, to some reflections on future prospects.

This book is mainly based on the latest research results and applications of phenolic and polyphenolic compounds. Phenolic compounds, ubiquitous in plants, are an essential part of the human diet and are of considerable interest due to their antioxidant properties and potential beneficial health effects. These compounds range structurally from a simple phenolic molecule to complex high-molecular-weight polymers. There is increasing evidence that consumption of a variety of phenolic compounds present in foods may lower the risk of health disorders because of their antioxidant activity. When added to foods, antioxidants control rancidity development, retard the formation of toxic oxidation products, maintain nutritional quality and extend the shelf-life of products. Due to safety concerns and limitation on the use of synthetic antioxidants, natural antioxidants obtained from edible materials, edible by-products and residual sources have been of increasing interest. This contribution summarizes both the synthetic and natural phenolic antioxidants, emphasizing their mode of action, health effects, degradation products and toxicology. In addition, sources of phenolic antioxidants are discussed in detail.

Natural antioxidants and anticarcinogens in nutrition, health and disease represents the most recent information and state-of-the-art knowledge on the role of antioxidative vitamins, carotenoids and flavonoids in ageing, atherosclerosis, and diabetes, as well as the role of natural anticarcinogenic compounds, particularly lignans and isoflavonoids, and cancer prevention. It is highly interdisciplinary, and will be of importance to all scientists working in the medical, biomedical, nutritional and food sciences as well as the academics.

Here is the most complete guide available for the analysis of tannins. A battery of tannin methodologies is presented in a simple, clear and easy-to-understand manner. This unique guide covers chemical, biological and radio isotopic tannin assays. Comprehensive step-by-step protocols are presented for each method. The protocols enable non-specialists and specialists alike to implement the methods easily in the laboratory. It is an ideal laboratory manual for research scientists, graduate students, and laboratory personnel working in the fields of animal nutrition, soil nutrient management, wild life-plant interactions, and plant breeding.

Phenolic compounds are an extremely diverse class of ubiquitous secondary metabolites produced by a variety of organisms playing different biological roles. They have numerous types of demonstrated bioactivities, including antioxidant, antimicrobial, anti-inflammatory, antitumoral, immunomodulator, neuroprotective, cardioprotective, and antidiabetic activities. Marine organisms produce a vast collection of unique phenolic structures, some of them not found in terrestrial habitats. Progress in different aspects is rapidly advancing, and this Special Issue will provide updated information and recent studies on marine phenolics. Specially, this issue is focused on their chemical characterization, elucidation of their structures, evaluation of their biological properties and mechanisms of action, efficient extraction and purification technologies, development of value-added applications, as well as formulation of novel products.

This book entitled “Cocoa, Chocolate, and Human Health” presents the most recent findings about cocoa and health in 14 peer-reviewed chapters including nine original contributions and five reviews from cocoa experts around the world. Bioavailability and metabolism of the main cocoa polyphenols, i.e., the flavanols like epicatechin, are presented including metabolites like valerolactones that are formed by the gut microbiome. Many studies, including intervention studies or epidemiological observations, do not focus on single compounds, but on cocoa as a whole. This proves the effectiveness of cocoa as a functional food. A positive influence of cocoa on hearing problems, exercise performance, and metabolic syndrome is discussed with mixed results; the results about exercise performance are contradictive. Evidence shows that cocoa flavanols may modulate some risk factors related to metabolic syndrome such as hypertension and disorders in glucose and lipid metabolism. However, several cardiometabolic parameters in type 2 diabetics were not affected by a flavanol-rich cocoa powder as simultaneous treatment with pharmaceuticals might have negated the effect of cocoa. The putative health-promoting components of cocoa are altered during processing like fermentation, drying, and roasting of cocoa beans. Chocolate, the most popular cocoa product, shows remarkable losses in polyphenols and vitamin E during 18 months of storage.

Quantification of Tannins in Tree and Shrub FoliageA Laboratory ManualSpringer Science & Business Media

???This book is devoted to grain legumes and include eight chapters devoted to the breeding of specific grain legume crops and five general chapters dealing with important topics which are common to most of the species in focus. Soybean is not included in the book as it is commonly considered an oil crop more than a grain legume and is included in the Oil Crops Volume of the Handbook of Plant Breeding.?Legume species belong to the Fabaceae family and are characterized by their fruit, usually called pod. Several species of this family were domesticated by humans, such as soybean, common bean, faba bean, pea, chickpea, lentil, peanut, or cowpea. Some of these species are of great relevance as human and animal food. Food legumes are consumed either by their immature pod or their dry seeds, which have a high protein content. Globally, grain legumes are the most relevant source of plant protein, especially in many countries of Africa and Latin America, but there are some constraints in their production, such as a poor adaptation, pest and diseases and unstable yield. Current research trends in Legumes are focused on new methodologies involving genetic and omic studies, as well as new approaches to the genetic improvement of these species, including the relationships with their symbiotic rhizobia.
Tannins are one of the polyphenols group found in plants and are mainly studied because of their structural properties and bioactive behavior. Every year new findings concerning their properties and functions are made, and today concerns are mainly focused on how they can be used efficiently in the wood, food, textile, health, and pharmaceutical industries. Thus, the aim of this book is to present the most updated information on the structural properties of tannins, their food sources and variations, biological properties, and health, among other important issues. In addition, the most recent methods used for their isolation, quantifications, and industrial applications will also be covered.
Free radicals and other reactive oxygen species are constantly formed in the human body and have been implicated in human diseases such as cancer, atherosclerosis, rheumatoid arthritis, Parkinson's disease, and malaria. This observation has raised the possibility that antioxidants could act as prophylactic agents. However, it remains to be fully established whether oxidative stress makes a significant contribution to the pathology of a given disease or whether it is an epiphenomenon. Indeed, development of specific assays applicable to humans would greatly contribute to our understanding of the role played by free radicals and their modulation by antioxidants in normal physiology and in human diseases. This book addresses the key methodological questions.
Adhesives were utilized in a sophisticated manner even in ancient times. Recent years have seen the rapid development of adhesive bonding as an economic and effective method for the fabrication of components and assemblies. The great many types of adhesives are currently in use and there is no adequate single system of classification for all products. The adhesives industry has generally employed classifications based on end use, such as metal to metal adhesives, wood adhesives, general purpose adhesives, paper and packaging adhesives etc. An adhesive or formulation is generally a mixture of several materials. The extent of mixture and the ratio usually depend upon the properties desired in the final bonded joint. The basic materials may be defined as those substances, which provide the necessary adhesive and binding properties. The type of adhesive material is easier to define and usually falls into three categories;

thermosetting resins, thermoplastic resins and elastomeric resins. A thermosetting system, 100 percent reactive when in a pure state, the epoxies are very desirable and more widely used than any other chemical type. Epoxy is one of the newer types and has penetrated more fields of manufacturing operations in a shorter space of time than any of its predecessors. The many catalysts used with epoxies produce systems of variable properties. The most common are the aromatic amines and cyclic anhydrides. The phenolics or phenol formaldehyde resins are formed by the condensation reaction of phenol and formaldehyde. The phenolic resins have been used extensively in the lamination of plywood and in filament wound structures. There are two basic classes of phenolic resins resoles and novalacs, and both begin as phenol alcohols. When combined or alloyed with other adhesive systems, they become excellent structural adhesives and are widely used in this manner throughout the aerospace industry. The vinyl polymers do not stand alone as a structural adhesive, but hundreds of adhesives are formulated by the use of this class of polymer. The vinyls are important to adhesive bonding not only from the adhesive standpoint, but because the films derived from these substances are widely used as vacuum bags, slip sheets, etc. The more widely used ones are polyvinyl chloride, polyvinyl alcohol, and polyvinyl fluoride. There are numerous kinds of adhesives used in different industries; polyvinyl acetate wood adhesives, aminoresin wood adhesives, phenolic resin wood adhesives, cynoacrylate adhesives, hot melt adhesives, water based adhesives etc. The market for adhesives is comprised of thousands of end uses. The realm of market applications expands as new end uses keep developing, driven by the need for new and innovative attachment solutions. When looking at the total market, adhesives account for about 75% of the volume consumed. This book basically deals with adhesive properties and general characteristics, adhesive materials and properties, adhesives types, thermoplastic adhesives, thermosetting adhesives, rubber resin blends, properties of basic adhesives types, acrylics acrylic acid diesters, allyl diglycol, carbonate, animal glues, blood albumen, butadiene styrene rubbers, butyl rubber and polyisobutylene casein, cellulose derivatives, cellulose acetate, acetate butyrate cellulose, caprate cellulose, nitrate (nitrocellulose or pyroxylin), ethyl cellulose, hydroxy ethyl cellulose, methyl cellulose and sodium carboxy methyl cellulose, ceramic or refractory inorganic adhesives cyanoacrylates, epoxy adhesives, epoxy nylon, epoxy polyamide, epoxy polysulphide, epoxy polyurethane, fish glue, furanes etc. The present book covers the manufacturing processes of different industrial adhesives with their formulae. It is hoped that the book can serve to new entrepreneurs, technocrats and existing units to the technology of adhesive and guide them to a useful understanding of the wide variety of adhesives which exist today.

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 work ing mainly with animaltissues. Thus, no simple guide to modern metho ds 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 biochemistry, pharmacognosy, 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 constituent. The intention here is to simplify 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 experiments which can be used in classwork.

The book "Grapes and Wines: Advances in Production, Processing, Analysis, and Valorization" intends to provide to the reader a comprehensive overview of the current state-of-the-art and different perspectives regarding the most recent knowledge related to grape and wine production. Thus, this book is composed of three different general sections: (1) Viticulture and Environmental Conditions, (2) Wine Production and Characterization, and (3) Economic Analysis and Valorization of Wine Products. Inside these 3 general sections, 16 different chapters provide current research on different topics of recent advances on production, processing, analysis, and valorization of grapes and wines. All chapters are written by a group of international researchers, in order to provide up-to-date reviews, overviews, and summaries of current research on the different dimensions of grape and wine production. This book is not only intended for technicians actively engaged in the field but also for students attending technical schools and/or universities and other professionals that might be interested in reading and learning about some fascinating areas of grape and wine research.

Food Science: Research and Technology presents a broad selection of new research in food science and reflects the diversity of recent advances in the field. Chapters include a study on the use of microbial enzymes for flavor and production in food production; studies of various natural foods, including litchi (lychee), pinto beans, and chickpeas; the content and antioxidant activity of dried plants; new applications of galactosidases in food products; a study of the medicinal properties of edible mushrooms; and more.

Like cereal, pulse processing is one of the oldest and most important of all food processing, which encompasses a diverse range of products. Pulses are widely grown throughout the world and their dietary and economic importance is globally appreciated and well recognized. Although cereal processing has several dedicated text books, no dedicated text on pulse processing is currently available for food science and technology graduates. This book aims to address this oversight, starting with a chapter highlighting the importance of pulses, their production and consumption trends. The coverage in subsequent chapters provides details on the physical and chemical characteristics of pulses, starches, proteins and minor constituents in them and then how they are processed and used. Cooking quality, analysis and the value of the food products will all be examined with the final chapter reviewing the regulatory and legislative requirements for pulses. This book will serve as a comprehensive text book for undergraduate and postgraduate students, educators, industry personnel

involved with grain processing and to some extent researchers providing an up-to-date insight into pulse science, processing and technology.

Plant secondary metabolites have been a fertile area of chemical investigation for many years, driving the development of both analytical chemistry and of new synthetic reactions and methodologies. The subject is multi-disciplinary with chemists, biochemists and plant scientists all contributing to our current understanding. In recent years there has been an upsurge in interest from other disciplines, related to the realisation that secondary metabolites are dietary components that may have a considerable impact on human health, and to the development of gene technology that permits modulation of the contents of desirable and undesirable components. Plant Secondary Metabolites: Occurrence, Structure and Role in the Human Diet addresses this wider interest by covering the main groups of natural products from a chemical and biosynthetic perspective with illustrations of how genetic engineering can be applied to manipulate levels of secondary metabolites of economic value as well as those of potential importance in diet and health. These descriptive chapters are augmented by chapters showing where these products are found in the diet, how they are metabolised and reviewing the evidence for their beneficial bioactivity.

Prosiding ini memuat sejumlah abstrak dan makalah yang disajikan dalam Celebes International Conference on Diversity of Wallacea’s Line (CICDWL 2015). Mengusung tema "Sustainable Management of Geological, Biological, and Cultural Diversities of Wallacea's Line toward A Millennium Era" seminar ini diselenggarakan di Kendari pada 8–10 Mei 2015.

Edited and authored by an international team of respected researchers, this book provides a summary of current research findings related to phytochemical compositions and properties of cereal and pulse crops. It will serve as a timely guide for scientists working in food ingredients, food product research and development, functional foods and nutraceuticals, crop breeding and genetics, post–harvest treatment and processing of cereal grains and pulses, and human nutrition to effect value–added food innovation for health promotion and disease risk reduction.

Norton is an important grape cultivar that is native to Missouri and grown widely because of disease resistance and wine quality. Wine quality is related to levels of flavonoids, and vineyard practices influence flavonoid accumulations. However, little research has examined accumulation of flavonoids in Norton fruit over the growing season. A two-year (2012-2013) study was initiated using Norton and Cabernet Sauvignon vines at Mountain Grove, MO, and a one year study in (2013) using Norton vines at Rocheport, MO. Cabernet Sauvignon, a well-studied grape cultivar was monitored for flavonoid accumulation as a comparison to Norton. Berry samples were collected at six stages of maturation from green berries at 43 days after flowering (DAF) to harvest (125 DAF). Levels of sugars, acids, and flavonoids such as anthocyanins, tannins, and total phenolics were estimated from berry skins at each harvest date. Compared to

Cabernet Sauvignon, Norton had 15% higher sugars, 9% higher acids, 72% higher anthocyanins, 40% lower tannins, and 9% lower total phenolics averaged over six stages. High levels of anthocyanins in Norton would contribute to higher quality wine based on color. However, lower tannin levels will result in a less astringent wine; tannins are added during fermentation to adjust astringency. Lower total phenolic content can decrease the stability of wine limiting storage. Documentation of Norton berry flavonoid content will allow future research to determine how vineyard practices can alter the concentration of flavonoids during berry development.

Cancer is a great challenge to efficient therapy due to biological diversity. Disturbed oxidative homeostasis in cancer cells certainly contributes to differential therapy response. Further, one of the hallmarks of cancer cells is adaptation which includes fine tuning of the cellular metabolic and signalling pathways as well as transcription profiles. There are several factors which contribute to the tumor diversity and therapy response, and oxidative stress is certainly one of them. Changes in oxygen levels due to hypoxia/reoxygenation during tumor growth modulate antioxidative patterns finally supporting increased cell diversity and adaptation to stressing conditions. Additionally, cancer chemotherapy based on ROS production can also induce also adaptation. To counteract these negative effects natural products are often used for their antioxidant activities as well as photodynamic therapy supported by novel chemosensitizers. Understanding of possible pathways which can trigger antioxidant defence at a certain time during cancer development can also provide possible strategies in fighting cancer.

This book will enlighten on some of the recent progress in diabetic care and therapy. Diabetes mellitus is a group of metabolic diseases in which a person has high blood sugar, either because the body does not produce enough insulin, or because of the inability of cells to respond to the insulin that is produced. According to the recent report of World Health Organization, 346 million people worldwide are suffering from diabetes, and in 2004, approximately 3.4 million people died as a result of high blood sugar. This book explores applying both classical and modern approaches to the management of diabetes by focusing on a holistic approach. Great attention has been focused on global trends in diabetes, epidemiology of diabetes, inhibitors in diabetes and diabetes therapy, vitamins and diabetes, and the role of dietary fats in diabetes in this book. Topics include: • diabetic foot ulcers and therapeutic footwear • Withania coagulans. Dunal as an antidiabetic herb • the pharmacological interventions for diabetic cardiomyopathy • the use of saliva as a noninvasive tool to monitor glycemic control in diabetic patients • a cutting-edge biomedical device for continuous in vivo glucose monitoring • the temporal effect of repeated stress in the pathophysiology of T2DM • nanosensor technology for glucose detection The editors and authors emphasize a holistic approach toward the diagnosis, treatment, and management of diabetes by joining hands with experts from

various disciplines Medical students and doctors of modern medicine, Ayurveda, homeopathy, etc., medical reserachers, researchers in the area of diabetes, pharma professionals.

This volume in the series is devoted to Africa, a continent that possesses a vast treasure of medicinal plants and has produced some exclusive materials for the world market. This volume is expected to strengthen the medicinal plant sector in African countries by making comprehensive information on medicinal and aromatic plants available to policy-makers and entrepreneurs. It can be used to frame effective policies and create an environment conducive to the growth of the plant-based medicine industry, bringing economic benefit to African nations. It will help health organizations to improve the health of their people by using their own resources and a less expensive system of medicine, which is accepted by African society. It could also lead scientific communities to increase R&D activities in the field.

This book is a printed edition of the Special Issue "Advances in Anthocyanin Research 2018" that was published in Molecules

The field of antioxidant research has grown rapidly over the last 30 years and shows no sign of slowing down. In order to understand how antioxidants work, it is essential to understand how their activity is measured. However, antioxidant activity measurements are controversial and their value has been challenged. This book addresses a number of the controversies on antioxidant testing methods. Specifically, the book highlights the importance of context, helping the reader to decide what methods are most appropriate for different situations, how the results can be interpreted and what information may be inferred from the data. There are a multiplicity of methods for measuring activity, with no standardized method approved for in vitro or in vivo testing. In order to select an appropriate method, a thorough knowledge of the processes associated with reduction-oxidation is essential, leading to an improved understanding and use of activity measurements and the associated data. The book presents background information, in a unique style, which is designed to assist readers to grasp the fundamentals of redox processes, as well as thermodynamics and kinetics, which are essential to later chapters. Recovery and extraction of antioxidants from diverse matrices are presented in a clear and logical fashion along with methods used to determine antioxidant activity from a mechanistic perspective. Other chapters present current methodologies used for activity testing in different sample types ranging from foods and plants, to body fluids and even to packaging, but always with a strong emphasis on the nature of the sample and the underlying chemistry of the method. A number of emerging techniques for assessing antioxidant behaviour, namely, electrochemical methods, chip technology exploiting microfluidic devices, metabolomics plus studies of gene and protein expression, are examined. Ultimately, these techniques will be involved in generation of "big data" for which an understanding of chemometrics will be essential in drawing valid conclusions. The book is written to appeal to a

wide audience, but will be particularly helpful for any researchers who are attempting to make sense of the vast literature and often conflicting messages on antioxidant activity.

Phenolic compounds comprise a broad class of natural products formed mainly by plants, but also microorganisms and marine organisms that have the capacity to form them. Nowadays the interest in these compounds has increased mainly due to their diverse chemical structure and wide biological activity valuable in the prevention of some chronic or degenerative diseases. The functional foods are a rich source of these phytochemicals, and this is the starting point for this book, which shows the state of the art of the phenolic compounds and their biological activity. This book integrates eleven chapters that show the state of the art of diverse biological activity of the phenolic compounds, present in some crops or fruits.

Dear Academicians, Readers and Educators, We are pleased to present the issue of the International Journal of Secondary Metabolite as a special issue entitled ‘I. International Congress on Medicinal and Aromatic Plants - “Natural And Healthy Life”’. This special issue contains some of scientific studies presented in the congress. Hosting the I. International Medical and Aromatic Plant Congress, held in Konya on 9-12 May 2017, by the coorperation T.R. Ministry of Forestry and Water Affairs, General Directorate of Forestry and Necmettin Erbakan University was a great honor for us. The total number of abstract submission for the congress was 1923. After the scientific evaluation, 85 abstracts were rejected and 244 abstracts were withdrawn. As a result, a total of 1594 abstracts were accepted for presentation: 280 of them as oral presentation and 1314 as poster presentation. 2604 authors were contributed and 1543 participants were participated to the congress. The studies presented in the congress was electronically shared in terms of accessibility. The authors of 220 papers, presented in the congress, submitted to the International Journal of Secondary Metabolite for publication. 70 of them were published and 150 full papers were rejected due to revision deadline, reviewing process etc. after reviewing process. I would like to special thank to the Journal founder for publishing and also to the editor, editorial board and authors for contributing this issue. Best regards. Dr. Muzaffer ?EKER Rector of Necmettin Erbakan University TC Orman ve Su ??leri Bakanl???, Orman Genel Müdürlü?ü ve Necmettin ErbakanÜniversitesi payda?l???nda, Necmettin Erbakan Üniversitesi ev sahipli?inde 9-12 May?s 2017 tarihlerinde Konya’da gerçekle?tirilen I. Uluslararas? T?bbi ve Aromatik Bitkiler Kongresi’nin aç?l?? program?, Orman ve Su ??leri Bakan? Say?n Prof. Dr. Veysel Ero?lu, Sa?l?k Bakan? Prof. Dr. Recep Akda?, Milletvekilleri, Konya Valisi Yakup Canbolat, Konya Büyük?ehir Belediye Ba?kan? Tahir Akyürek, Afyon Kocatepe Üniversitesi Rektörü Prof. Dr. Mustafa Solak, Necmettin Erbakan Üniversitesi Rektörü Prof. Dr. Muzaffer ?eker, Orman Genel Müdürü, Dekanlar, Akademisyenler, Daire Ba?kanlar?, ö?renciler ve sektörde faaliyet gösteren i?adamlar?n?n kat?l?m?yla gerçekle?tirilmi?tir. Kongre,

son y?llarda yap?lan en geni? kat?l?ml? bilimsel organizasyon olma özelli?i ta??maktad?r. Kongreye t?bbi ve aromatik bitkilerin dahil oldu?u pek çok alandan tan?nm?? ve seçkin akademisyenler kat?lm??t?r. Davetli Konu?mac? olarak kongreye kat?lan Mauritius Üniversitesi'nden Vidushi Neergheen-Bhujun, Handong Global Üniversitesi'nden Jong Bae Kim, Malezya'dan ve Ege Üniversitesi'nden emekli Prof. Dr. Münir Öztürk, Yeditepe Üniversitesi'nden Prof. Dr. Erdem Ye?ilada, Sebahattin Zaim Üniversitesi'nden Prof. Dr. Adem ELGÜN, TÜB?TAK Marmara Ara?t?rma Merkezi'nden Prof. Dr. Cesarettin Ala?alvar, Hacettepe Üniversitesi'nden Prof. Dr. ?rem Tatl? Çankaya ve Cumhurba?kan? ba?dan??man? Prof. Dr. ?brahim Adnan Saraço?lu bunlar aras?nda say?labilir. Kongrede üç gün boyunca yedi ayr? salonda a?a??daki ba?l?klar alt?nda sözlü ve poster bildiriler sunulmu? ve yo?un kat?l?m gözlenmi?tir. ? T?bbi Bitki, Aromatik Bitki ve Mantar Üretimi ? T?bbi ve Aromatik Bitkisel Ürün Sanayii ? Fonksiyonel G?dalar, Bitkisel Çaylar ve Nutrasötikler ? Tabii Kozmetik Ürünler ? Aromatik Bitkiler ve Uçucu Ya?lar ? Farmakoloji, Farmakognozi (Toksikoloji, Farmakovijilans) ? Tabii Bitki Örtüsünün Korunmas? ve Etnobotanik ? T?bbi ve Aromatik Bitkilerde Antropoloji, Sosyo-Ekonomi, Kültür ve Etik ? T?bbi ve Aromatik Bitkilerin Ak?lc? Kullan?m? Kongrede sözlü sunular Lokman Hekim, Farabi, ?bn-i Sina, Ak?emsettin, Mevlâna ve Balo Salonlar?nda, poster sunular ise Poster Salonunda gerçekle?tirilmi?tir. Kongre süresince; Selva Redoks, Tales Analitik, Dr. Mustafa Mücahit Y?lmaz, Sem, Yap?lcan, Biosan firmalar? ile Orman Su ??leri Bakanl???, Konya Büyük?ehir Belediyesi Park ve Bahçeler Daire Ba?kanl???, NEÜ G?da Mühendisli?i Bölümü, NEÜ Sa?l?k Bilimleri Fakültesine ait stantlarda t?bbi ve aromatik bitkilerle ilgili ürün ve yay?n tan?t?mlar? gerçekle?tirilmi?tir. Orman Genel Müdürlü?ü kongreye ödüllü foto?raflar sergisi ile renk katm??t?r. Kongremizin düzenlenmesinde 12 Yürütme Kurulu, 24 yerli 25 yabanc? olmak üzere 49 Bilim Kurulu ve 11 Dan??ma Kurulu üyesi görev yapm??t?r. Kongremize toplam 1543 kat?l?mc? ba?vurmu? olup, kat?l?mc?lar içerisinde 520 ö?retim eleman?, 483 ö?retim üyesi, 429 ö?renci ve 111 sektör temsilcisi/dinleyici yer alm??t?r. Kongremize 524 bay kat?l?mc?, 1019 bayan kat?l?mc? ba?vurmu?tur. Kongreye bildiri gönderen 2604 yazardan; 382 adeti ziraat, 321 adeti g?da, 311 adeti orman, 270 adeti mühendislik, 225 adeti sa?l?k, 161 adeti diyetisyenlik, 157 adeti veterinerlik, 145 adeti farmakoloji, 104 adeti eczac?l?k, 37 adeti di? hekimli?i ve 491 adeti kozmetik, peyzaj, sosyal, kültürel vb. di?er alanlarda çal??t??? belirlenmi?tir. Kongreye toplam bildiri ba?vurusu 1923 adet olup, bilimsel de?erlendirme sonucu 85 adeti reddedilmi?, 244 adet bildiri geri çekilmi?tir. Sonuç olarak 280 bildiri sözlü bildiri olarak ve 1314 bildiri poster bildiri olmak üzere toplam 1594 bildiri kabul edilmi?tir. Sözlü bildiriler konular?na uygun olarak 48 oturumda, poster bildiriler ise 14 oturumda sunulmu?lard?r. Bu bildiriler içerisinde yazarlar taraf?ndan bildiri kitab?nda bas?lmak üzere 159 tam metin gönderimi gerçekle?tirilmi?, ayn? zamanda uluslararas? alan indeksli International Journal of Secondary Metabolite dergisine de 173 tam metin makale gönderilmi? olup toplam 332 adet tam metin

haz?rlanm??t?r. Kongre web sayfam?za 45 bin tekil ziyaretçi girmi? ve 4 milyondan fazla hit olu?turmu?lard?r. Kongre duyurular? ve hat?rlatmalar? için 150 binden fazla mail gönderilmi? olup, yakla??k 15 bin mail al?nm??t?r. Kongre ile ilgili sekretarya üzerinden yakla??k 6000 görü?me yap?lm??t?r. Yukarda ifade edilen konferans, bildiri oturumlar? ve toplant?larda; t?bbi ve aromatik bitkiler sektöründe ortaya ç?kan reform ihtiyaçlar?, mevzuat, ula??m ve kalite sorunlar? vb. konular tart???lm??t?r. Ortaya ç?kan sonuçlar, kongre düzenleme kurulu taraf?ndan sonuç bildirgesi haline getirilmi?tir. Sonuç Bildirgesi ile tam metin kongre kitab? e-kongre kitap olarak kongre payda?lar?na ait web siteleri ile kongre web sitesinden (www.tabkon.org) kamuoyu ile payla??lacakt?r. SONUÇ ve DE?ERLEND?RME RAPORU Kongre de?erlendirme oturumu soru-cevap k?sm?ndan elde edilen sonuçlar ile de?erlendirmelerini gönderen bilim insanlar?n görü?leri, a?a??da yer ald??? gibi özetlenebilir: 1- Bitkisel ürünlerin sa?l?k üzerine olumlu etkilerinin oldu?u bilinmektedir. Ancak bu ürünlerin yanl?? kullan?m? nedeniyle karaci?er nakline kadar gidebilen hayati ve ciddi sa?l?k sorunlar?na yol açabildi?i görülmektedir. Sektörün ve vatanda??n sorunlar?na yönelik çözüm üretmek amac?yla Bakanl?klar (Orman ve Su ??leri Bakanl???, Sa?l?k Bakanl???, G?da, Tar?m ve Hayvanc?l?k Bakanl??? ve Gümrük ve Ticaret Bakanl???) aras?nda bir TIBB? VE AROMAT?K B?TK?LER KOORD?NASYON ÜST KURULU olu?turulmal?d?r. 2- Bölgemizin t?bbi ve aromatik bitkiler sektöründe; ilk olarak bölgelere göre t?bbi-aromatik bitki üretim planlama çal??malar? yap?lmal?d?r. Bölgelere göre ekonomik de?eri ve üretim potansiyeli yüksek bir veya birkaç bitki türü belirlenmelidir. Bu bitki türünün do?adan toplama ve kültüre al?narak üretilebilecek türleri ayr? ayr? belirlenmelidir. Gerekli ürünün belirlenmesi, üretim planlamas? ve fiyatland?rma çal??malar?n? yapmak için yerelden; STK, kamu ve özel sektör uzmanlar?n?n yer ald??? farkl? disiplinlerden müte?ekkil bir komite kurulmal?d?r. Bu belirlenen bitkilerin gerek toplanmas? gerekse kültüre al?narak üretilmesi için gerekli organizasyonlar ve destekler sa?lanmal?d?r. 3- Ülkemiz çok zengin do?as?na ra?men, hala i?lenmemi? bir bitki ihracatç?s? olmaya devam etmektedir. Ülkemizde bitkisel ilaç sanayinin geli?memesi, bunun yan?nda parfümeride kullan?lan sentetik ürünlerin daha ucuz olmas? gibi nedenlerle, do?al uçucu ya?lar?n ikinci planda kalmas?, t?bbi ve aromatik bitkilerin üretim olanaklar?n? k?s?tlam??t?r. 6 4- T?bbi ve aromatik bitkilerin mevcut durumunu korumak ve artan pazarda yer almas?n? sa?lamak için piyasan?n istedi?i ürünleri istedi?i miktar ve kalitede sunmam?z önem arz etmektedir. Do?al zenginliklerimizin sürekli li?i ve gelecekteki ara?t?rmalar için gen kaynaklar?n?n korunmas? (insitu ve ex-situ) önemlidir. Ancak t?bbi ve aromatik bitki üretimini do?adan toplayarak kar??lamam?z mümkün de?ildir. Yeterli miktarda, standart ve kaliteli ürün üretmek için bu bitkilerin kültüre al?nmas? ve ?slah? önem arz etmektedir. T?bbi aromatik bitkilerde ülkemiz endemik bitkilerinin isimlendirilmesinde terminoloji birlikteli?i ve bölgesel co?rafi farkl?l?klar? tan?mlay?c? temel bilgilerin netle?tirilmesi gerekmektedir. Ayr?ca ülkemiz floras?na uygun çe?it ?slah?na

yönelik proje çal??malar? yapt?r?lmas? gerekmektedir. (kültüre alma, adaptasyon, ?slah vb.) 5- T?bbi ve aromatik bitkilere ait düzenli istatistiksel veriler bulunmamaktad?r. Bu arz-talep ili?kisi dikkate al?narak üretim yapmay? zorla?t?rmaktad?r. Bu nedenle bitkilerle ilgili bilgilerin toplanaca?? ve ula??labilece?i veri bankalar? olu?turulmal?d?r. Yurt içi ve yurt d???nda ticareti yap?lan do?al bitkilerin tam bir listesi, toplay?c?, arac?, ihraç eden firma ve ilgili devlet kurumlar?yla birlikte haz?rlanmal? ve bir veri taban? olu?turulmal?d?r. T?bbi ve aromatik bitkilerin do?adan toplanmalar? kontrol alt?na al?nmal?, nesli tehlikede olanlar koruma alt?na al?nmal?, öncelikle tar?m?na geçilmeli, tüm bu bilgiler olu?turulacak veri taban?nda yer almal?d?r. 6- En çok ihracat? yap?lanlar d???ndaki bitkisel ürünler ihracat istatistiklerinde "di?erleri" fasl?nda yer almaktad?r. Bu yüzden ülkemizden ihraç edilen droglar?n tam bir listesine ula?abilmek mümkün olmamaktad?r. Bu bitkiler üzerinde sa?l?kl? çal??malar yap?labilmesi için bunlar?n ticaretlerinin izlenmesi, ihracat ve özellikle üretim miktarlar?n?n ve bunlar?n ne kadar?n?n do?adan toplama ve ne kadar?n?n da tarla üretiminden geldi?inin istatistiklerde aç?k ve net olarak yer almas? zorunlulu?u bulunmaktad?r. 7- Tüketici ve sanayici taleplerine cevap veren kaliteli ve standart ürün için ?slah edilmi? çe?itlerin geli?tirilmesi, uygun ekolojik ko?ullar?n belirlenmesi, do?al bitkilerin do?aya zarar vermeden zaman?nda toplanmas?, hasat sonras? i?lemler ve i?leme teknolojisinin belirlenmesi t?bbi ve aromatik bitkilerde üretim ve pazar olanaklar?n? artt?racakt?r. Bölgelere göre, birkaç üründe özüt ve etken madde üretimine geçilmesi, üretilen ürünler için markala?ma ve standart olu?turma 7 faaliyetlerinin yürütülmesi elzemdir. Ayr?ca ham madde üretimini ikincil ürünlere dönü?türecek tar?ma dayal? sanayi tesislerinin bölgeye kazand?r?lmas? oldukça önemlidir. 8- G?da, Tar?m ve Hayvanc?l?k ?l müdürlüklerinin, fide ve tohum da??t?lmas? noktas?nda il özel idaresiyle birlikte projeler yapmas?n?n çok etkili olacakt?r. 9- T?bbi ve aromatik bitkiler alan?nda faaliyet gösteren üretici, toplay?c?, ihracatç?, sanayici, ara?t?rmac? ve di?er tüm payda?lar?n koordinasyonunu sa?layacak bir sistem ve ara?t?rma sonuçlar?n?n prati?e aktar?lmas? için, ara?t?r?c?, sanayici, üretici aras?nda bilgi ak???n? sa?layacak yay?n sistemi olu?turulmal?d?r. 10- Genetik kaynaklar kullan?larak tar?ma ve ülke ekonomisine endemik, vb. ekonomik de?eri olan bitkiler kazand?r?lmal?d?r. Genetik materyal(tohumluk-fide) yetersizli?ini gidermek için çal??malar yap?lmal?d?r. 11- Ta??i? (yabanc? madde kar??t?rma) problemine kar?? standardizasyon sa?lanmal?d?r. 12- Aktar dükkan? açmak için T?bbi ve Aromatik Bölüm mezunu olma ?art? getirilmelidir. 13- ?ki y?l?k olan e?itim süresi yetersizdir. Avrupa ülkelerindeki gibi Medikal Herbalist'lik ?eklinde uygulamal? en az üç y?l?k e?itim verilmelidir. 14- Hali haz?rdaki müfredat gözden geçirilerek bu konudaki söz sahibi ülkelerdeki gibi e?itim verilmelidir. Okullar aras?nda müfredat birli?i sa?lanmal?d?r. E?itimcilerin bu konuda yetkinli?i ?art ko?ulmal?d?r. Meslek gereklerine uygun, donan?ml? mezunlar?n yeti?ebilmesi için e?itime uygun altyap? sa?lanmal?d?r. 15- Bu bölüm mezunlar?na yeterli e?itim verilerek "herbalist" ünvan? verilebilir. Ve

yasalarca da tan?nabilir. Mevcut unvan olan “T?bbi ve Aromatik Bitkiler Teknikeri” uzun bir unvan oldu?undan daha ak?lda kal?c? bir unvan için düzenleme yap?lmal?d?r. 16- Baharat, bitkisel g?da takviyesi, do?al kozmetik, bitki çay?, bitkisel ilaç üreten i?yerleri ile bu tür ürünlerin sat???n?n yap?ld??? eczane, aktar, organik ürün dükkânlar?nda bölüm mezunlar?n?n çal??t?r?lmas? zorunlulu?u yasalarca dikkate al?nmal?d?r. 17- Bilimsel ara?t?rma sonuçlar?n?n prati?e aktar?lmas? noktas?nda çal??malar?n yap?lmas? gerekmektedir. Elde edilen sonuçlar?n ulusal ve uluslararas? ölçüde katk? yapmas? beklenmektedir. 18- Ülkemizde bitkisel ilaç sanayinin geli?mesine yönelik çal??malara destek verilmelidir. 8 19- Uluslararas? ticarette önem ta??yan türlerin üretimi ve ihracat?n?n artt?r?lmas? gerekmektedir. 20- Pazar garantili bahçe-tarla uygulamalar?na yönelik çal??malar ile markala?maya yönelik çal??malar yap?lmal?d?r. Ayr?ca stratejik de?eri olan ürünlerin üretimine gidilmelidir. 21- Herhangi bir zaman diliminde popüler olan tür ya da ürün üzerine yo?unla?mak yerine her dönem önemini kaybetmeyen türlere önem verilmelidir. 22- T?bbi ve aromatik bitkilerin tar?m? için orman arazileri yerine tar?msal alanlar?n ayr?lmas? gereklidir. 23- T?bbi ve aromatik bitki analizi ile ilgili yetkin laboratuvarlar arac?l???yla kriterler belirlenmeli (bile?enlerin içeri?i ve miktar?) ve yap?lacak çal??malarda bu standartlar baz al?nmal?d?r. 24- Bitkilerin do?ru tan?mlanmamas? önemli bir hata olarak kar??m?za ç?kmaktad?r. Bu konuda yetkinli?i olan ki?ilerle ortak çal???lmal?d?r. 25- Üretim teknolojileri ile ilgili çal??ma yapmak isteyen yat?r?mc?lara gerekli e?itimler bakanl?k vb. kurumlar?n deste?iyle verilmelidir. 26- Fitoterapi konusunda Sa?l?k Bakanl???’n?n deste?i gereklidir. 27- G?da takviyesi olarak sat?lan ürünlerin ruhsatland?r?lmas? Sa?l?k Bakanl??? taraf?ndan yap?lmal?d?r. 28- Bilimsel çal??malara konu olan bitkiler aktar veya pazardan temin edilmemeli, do?al ortam veya kültür ortam?ndan al?nmal?. Bu tür bildiriler bilimsel kongrede kabul edilmemelidir. 29- T?bbi ve aromatik bitkilerin üretimi esnas?nda zirai mücadelede ruhsatl? pestisit üretimi üzerine çal??malar yap?lmal?d?r. 30- Kongre esnas?nda posterlerin okunabilmesi için daha uzun süre as?l? kalmal?d?r. ?lave olarak bu amaca dönük olarak posterler elektronik ortamda yay?mlanmal?d?r. 31- Kongrede kullan?lan dilin Türkçe ve ?ngilizce olmas? önem arz etmektedir. 32- Etnobotanikte 70 farkl? çe?it bitkiye “kekik” ad? veriliyor. Bunu giderecek çal??malar yap?lmal?d?r. 33- Sar? ve k?rm?z? kantaronun etki mekanizmalar? farkl? olmas?na kar??n, bu bitkiler kar??t?r?larak hataen birbirinin yerine kullan?labilmektedir. Bu yüzden baz? sa?l?k problemleri ya?anabilmektedir. Bu ve benzeri durumlar?n giderilmesi için gerekli çal??malar yap?lmal?d?r. 9 34- Lavanta vb. endemik bitkilerin ülke ekonomisine kazand?r?lmas? için çal??malar yap?lmal?d?r. 35- T?bbi ve aromatik bitkiler üzerine farkl? bilim disiplinlerinin i?birli?i içinde yürütece?i multidisipliner çal??malar ve toplant?lar?n say?s? art?r?lmal?d?r. Fakat bu toplant?lar belli bir koordinasyon içinde yürütülmelidir. Benzer tarzda fazla say?da yak?n tarihli ve içerikli toplant?lar düzenlenmektedir. 36- T?bbi ve aromatik bitkilerle ilgili kongrelerin mutat olarak ulusal ve uluslararas? bazda düzenlenmesi

gerekir. Bunun için 2 y?lda bir ulusal 4 y?lda bir uluslararas? kongre düzenlenmesine karar verilmi?tir. Gerçekle?tirilecek kongrelerden ç?kacak sonuç ve öneriler, akademik, ekonomik ve üretim/ürün/faydal? model/yeni teknolojiler ç?kt?lar?n?n olmas? için azami özen ve gayretin gösterilmesi büyük öneme haizdir. 37- Bir sonraki Ulusal T?bbi ve Aromatik Bitkiler Kongresi'nin Afyon Kocatepe Üniversitesi ev sahipli?inde 2018-2019 e?itim ö?retim döneminde Afyon'da yap?lmas?na karar verilmi?tir. Kongre sonuçlar?n?n; ülkemize, bilim insanlar?na, üreticilere, sanayicilere ve bütün insanl??a olumlu katk? yapmas? dile?iyle…16.05.2017- Konya