

## Phytochemical And Biological Activities Of Tacca Chantrieri

A single plant species contains a huge number of potential bio-active molecules, which represent the end products of the plant metabolism. The corresponding code, named metabolome, is the core subject of modern phytochemical studies. This work describes different approaches for the study of medicinal plants, highlighting how relevant is the application of new technologies to better understand the enormous variety of chemicals present in the plant kingdom.

Fruit and Vegetable Phytochemicals: Chemistry, Nutritional Value and Stability provides scientists in the areas of food technology and nutrition with accessible and up-to-date information about the chemical nature, classification and analysis of the main phytochemicals present in fruits and vegetables – polyphenols and carotenoids. Special care is taken to analyze the health benefits of these compounds, their interaction with fiber, antioxidant and other biological activities, as well as the degradation processes that occur after harvest and minimal processing.

Medicinal plants contain a variety of bioactive compounds, (also referred to as phytochemicals). in the leaves, stems, flowers and fruits. This book covers these bioactive compounds, their available sources, how the bioactive molecules are isolated from the plants, the biochemistry, structural composition and potential biological activities. Also discussed are the pharmacological aspects of medicinal plants, phytochemistry and biological activities of different natural products, ethnobotany and medicinal properties, as well as a novel dietary approach for various disease management and therapeutic potential. The importance of phytopharmaceutical of plants and potential applications in the food and pharma industries is highlighted.

Phytochemicals from medicinal plants are receiving ever greater attention in the scientific literature, in medicine, and in the world economy in general. For example, the global value of plant-derived pharmaceuticals will reach \$500 billion in the year 2000 in the OECD countries. In the developing countries, over-the-counter remedies and "ethical phytomedicines," which are standardized toxicologically and clinically defined crude drugs, are seen as a promising low cost alternatives in primary health care. The field also has benefited greatly in recent years from the interaction of the study of traditional ethnobotanical knowledge and the application of modern phytochemical analysis and biological activity studies to medicinal plants. The papers on this topic assembled in the present volume were presented at the annual meeting of the Phytochemical Society of North America, held in Mexico City, August 15-19, 1994. This meeting location was chosen at the time of entry of Mexico into the North American Free Trade Agreement as another way to celebrate the closer ties between Mexico, the United States, and Canada. The meeting site was the historic Calinda Geneve Hotel in Mexico City, a most appropriate site to host a group of phytochemists, since it was the address of Russel Marker. Marker lived at the hotel, and his famous papers on steroidal saponins from *Dioscorea composita*, which launched the birth control pill, bear the address of the hotel.

Terpenes belong to the diverse class of chemical constituents isolated from materials found in nature. They play a very important role in human health and have significant biological activities, including anticancer, antimicrobial, anti-inflammatory, and antioxidant effects. This book provides an overview and highlights recent research in the phytochemical and biological understanding of terpenes and terpenoids, examining the most essential functions of these kinds of secondary metabolites.

This book is an account of the phytochemical analysis of two genera, *Vernonia* and *Vepris* which are used as remedies for illness by the Kalenjin community of Kenya. Species of *Vernonia* are known to yield sesquiterpene lactones, which typify the genus whereas *Vepris* is rich in alkaloids and limonoids which have a wide range of biological activities. The species studied in this work were *Vernonia auriculifera*, *Vernonia urticifolia*, *Vepris glomerata* and *Vepris uguenensis*. Phytochemical studies revealed a range of compounds being present in the four species. From *Vernonia*, triterpenoids, a sesquiterpene amine, a carotenoid and a polyene were isolated. In *Vepris*, a range of compounds were isolated, belonging to the furoquinoline alkaloids, coumarins, flavonoids, cinnamic acid derivatives, lignins, cinnamaldehydes, triterpenoids and limonoids.

Free radicals are atoms or molecules containing unpaired electrons. Damage occurs when the free radical encounters another molecule and seeks to find another electron to pair its unpaired electron. Free radicals can cause mutation in different biological compounds such as protein, nucleic acids, and lipids, and the damage caused by the free radicals lead to various diseases (cancer, cardiovascular disease, aging, etc.). Antioxidants are helpful in reducing and preventing damage from free radical reactions because of their ability to donate electrons, which neutralize the radical without forming another. Ascorbic acid, for example, can lose an electron to a free radical and remain stable itself by passing its unstable electron around the antioxidant molecule. Unfortunately, new data indicate that the synthetic antioxidants used in the industry could have carcinogenic effects on human cells, thus fueling an intense search for new, natural, and efficient antioxidants. Therefore, the current book discusses the role and source of antioxidant compounds in nutrition and diets. Also, the current book includes nine chapters contributed by experts around the world, and the chapters are categorized into two sections: "Antioxidant Compounds and Biological Activities" and "Natural Antioxidants and Applications."

CRC Handbook of Biologically Active Phytochemicals and Their Activities presents an alphabetical catalog of some 3,000 biologically active phytochemicals (elements and compounds) from higher plants. The data includes at least one and in some cases as many as 25 biological activities for each phytochemical. The book's tables also provide data on effective dose, inhibitory concentrations, and lethal and/or toxic doses. Entries after 1990 indicate the source of the data. CRC Handbook of Biologically Active Phytochemicals and Their Activities makes it possible for the first time to locate the concentration of many compounds in plants and compare this data with dosage information to calculate how much of a given plant food it would take to cause lethality, antioxidant activity, hypoglycemic activity, or artemicidal activity. These handy tables of hard-to-find information make this book an indispensable resource for pharmacologists, toxicologists, nutritionists, pharmacognocists, and food scientists.

Phytochemicals provides original research work and reviews on the sources of phytochemicals, and their roles in disease prevention, supplementation, and accumulation in fruits and vegetables. The roles of anthocyanin, flavonoids, carotenoids, and taxol are presented in separate chapters. Antioxidative and free radicle scavenging activity of phytochemicals is also discussed. The medicinal properties of *Opuntia*, soybean, sea buckthorn, and gooseberry are presented in a number of chapters. Supplementation of plant extract with phytochemical properties in broiler meals is discussed in one chapter. The final two chapters include the impact of agricultural practices and novel processing technologies on the accumulation of phytochemicals in fruits and vegetables. This book mainly focuses on medicinal plants and the disease-preventing properties of phytochemicals, which will be a useful resource to the reader.

Database of Biologically Active Phytochemicals and Their Activities presents an alphabetical tabulation of some 3,000 biologically active phytochemicals (elements and compounds) from higher plants. The data includes at least one and in some cases as many as 25 biological activities for each phytochemical. The database also provides data on effective dose, inhibitory concentrations, and lethal and/or toxic doses. Entries after 1990 indicate the source of the data. Database of Biologically Active Phytochemicals and Their Activities makes it possible to locate the concentration of many compounds in plants and compare this data with dosage information to calculate how much of a given plant food it would take to cause lethality, antioxidant activity, hypoglycemic activity, or artemicidal activity. Using WordPerfect (TM) 5.1's search function, you can find compounds by entering a key word in their name (e.g., choline or salicyl-), locate all compounds with a given activity (e.g., hypotensive), or list all compounds for which

ED50 data is entered or reported.

Nature is an inexhaustible source of organic molecules many of which possess important biological activities. Plants are considered to be a repository of a large number of these molecules. The study of plants for their secondary metabolites will continue to be an important and relevant area of research activity globally for the discovery of novel compounds that may have therapeutic and biological properties that are beneficial to man existence. The book describes the isolation, purification, characterization and biological activities of secondary metabolites from a medicinal plant.

This is the first volume to be published under a new series agreement for Recent Advances in Phytochemistry, co-published with the Phytochemical Society of North America.

The Biological Activity of Phytochemicals Springer Science & Business Media

Phytochemicals are health-protecting compounds of plant origin. They provide flavor and color to the edible, fruits, plants, herbs and beverages. Health protecting effects of phytochemicals are due to antiinflammatory, antioxidant, antiviral, antibacterial, anticarcinogenic, and cellular repair properties. There has been considerable interest in defining biological activities of phytochemicals at the molecular level. The effects of phytochemicals can be conducive, additive, synergistic, and antagonistic. Through these properties, phytochemicals modulate cellular differentiation, proliferation, oxidative stress, inflammation and apoptosis. This book presents an integrated view on molecular mechanisms of beneficial effects of phytochemical action in acute and chronic human diseases.

Increasing knowledge of the various protective effects of phytochemicals has sparked interest in further understanding their role in human health. Phytochemicals: Health Promotion and Therapeutic Potential is the seventh in a series representing the emerging science with respect to plant-based chemicals. Drawn from the proceedings at the Seventh International Phytochemical Conference, Phytochemicals: Health Promotion and Therapeutic Potential, the book contains chapters written by conference presenters along with those of additional invited authors whose research focuses on the biological activities and clinical outcomes associated with phytochemical consumption. The book begins with a discussion of major research that has contributed to the widespread interest in phytochemicals and health promotion. This is followed by an exploration of the beneficial effects of polyphenols in healthy aging and against a host of illnesses and disorders, including cancer, cardiovascular disease, inflammation, and ulcers. The contributors also examine various aspects of phytochemicals related to bone and brain health, obesity, and metabolic disease. The book concludes by presenting methodologies for assessing the bioavailability of carotenoids and offers additional insight into *Momordica cochinchinensis* Spreng, a fruit not commonly known in the Western world and a rich source of lycopene and beta-carotene. While promising advancements have been made in this field, opportunities for progress still exist concerning bioavailability, efficacy, genomics, and synergistic mechanisms. This book is destined to stimulate increased interest in research regarding these compounds, their biological activities, and the application of these findings to therapeutic alternatives.

The study of *Hypericum revolutum* subspecies *keniense* (Schweinf) of family Hypericaceae, hereafter referred as *Hypericum keniense* is crucial to validate folklore use. The objective of the study is to report on pharmacognostic and phytochemical investigations of the plant constituents, screen it for biological activity and its phytochemistry. The study and publication is meant to avail general information for all students who wish to work on medicinal plants. The findings show that the leaves, flowers, stem and stem bark contain saponins, tannins, cardiac glycosides, anthracene glycosides, flavonoids, volatile oils, coumarins and carotenoids but alkaloids and cyanogenic glycosides were absent. Extracts also are active against tested bacteria and fungal strains indicating that more activity is in the methanolic and aqueous extracts, LC50 values ranging from 100-5011 g/ml using brine shrimp lethality test. The extracts are safe used for a short period and betulinic acid is present in the plant and therefore more research is necessary for other claimed activities."

Phytochemistry is the branch of science that deals with the study of plant-derived chemicals or compounds, which are also known as phytochemicals or plant-derived secondary metabolites. Plants are known to produce phytochemicals that are essential for their growth and reproduction, as they protect them from insects, pathogens, and herbivores. Some of the major groups of plant-derived secondary metabolites are phenolics, flavonoids, terpenoids, alkaloids, tannin etc. Plant-derived phytochemicals are pharmacologically active and have the potential to cure various human diseases and disorders. Natural plant products have been known for their medicinal properties for untold years, and form the basis of several medicinal systems such as Chinese, Unani, and Ayurvedic Medicine. This book offers an essential introduction to phytochemicals and their synthetic analogues. It discusses various *in silico* approaches used to identify pharmacologically active phytochemicals and their biological activities, as well as *in vitro* and *in vivo* models/assays that have been utilized for the pharmacological profiling of plant-derived products to combat cancer, diabetes, cardiovascular diseases and neurological disorders. The intended audience includes upper-level undergraduate and graduate students; researchers and scientists from the pharmaceutical/food chemistry/nutrition sciences/biochemistry, and clinical biochemistry fields; and medical students. Sharing the latest findings, the book will familiarize these readers with the concepts, chemistry, and tremendous potential of phytochemistry.

Phytochemicals from Medicinal Plants: Scope, Applications and Potential Health Claims explores the importance of medicinal plants and their potential benefits for human health. This book looks at bioactive compounds from medicinal plants, the health benefits of bioactive compounds, the applications of plant-based products in the food and pharmaceutical industries. The first section discusses available sources of bioactive compounds from medicinal plants, biochemistry, structural composition, potential biological activities, and how bioactive molecules are isolated from medicinal plants. The authors examine the applications of bioactive molecules from a health perspective, looking at the pharmacological aspects of medicinal plants, the phytochemical and biological activities of different natural products, and ethnobotany/and medicinal properties, and also present a novel dietary approach for disease management. The book goes on to examine the plant-based products are used and can be used in various sectors of the food and pharmaceutical industries.

Cancer is a disease that affects a person not just physically but also psychologically. The pain involved, the immense cost of treatment and side effects made the researchers to shift from allopathy to allelopathic medical cure for the treatment. Seaweeds are the marine macro-algae found to be rich in nutrients including antioxidants and various remarkable properties. Certain brown seaweeds are exhibiting excellent antioxidant activity and anticancer activity. Hence, in the present investigation three different seaweeds such as *Kappaphycus alvarezii*, *Gracilaria*

verrucosa, *Enteromorpha intestinalis* were selected for the screening of certain biological activities. From the findings, it is highly recommended that like medicinal plants, seaweeds also possess strong antioxidant, anticancer and antibacterial properties. Hence this preliminary investigation from selected three seaweeds will help to do further studies on isolating bioactive compounds from seaweeds and detailed molecular level investigation of its antitumor potential may result in new drug discovery.

*Thunbergia grandiflora* (Acanthaceae) has been investigated for isolation of its secondary metabolites and evaluation of biological activities of the crude extract. One compound had been isolated, which was identified by extensive analyses of resolution NMR spectral data. The powdered leaf of *T. grandiflora* was extracted separately with methanol. The solid extract was then subjected to vacuum liquid chromatography (VLC). Repeated chromatographic separation and purification of the leaves of *Thunbergia grandiflora* afforded one flavonoid named 5-hydroxy-4',6,7-trimethoxyflavone, C<sub>18</sub>H<sub>16</sub>O<sub>6</sub>. The methanolic crude extract of *Thunbergia grandiflora* showed moderate analgesic activity. Out of all the samples only chloroform fraction methanolic crude extract were appeared mild potent in terms of both zone of inhibition & spectrum of activity against some gram positive, gram negative bacteria and fungi. In antidiarrhoeal test and brine shrimp lethality bioassay, hexane, carbon tetrachloride, chloroform and aqueous fractions exhibited insignificant activities whereas Carbon tetra chloride fraction showed some hypoglycemic effect at a dose of 300 mg/kg body weight compared to control group.

Medicinal plants are used to treat diseases and provide health benefits, and their applications are increasing around the world. A huge array of phytochemicals have been identified from medicinal plants, belonging to carotenoids, flavonoids, lignans, and phenolic acids, and so on, with a wide range of biological activities. In order to explore our knowledge of phytochemicals with the assistance of modern molecular tools and high-throughput technologies, this book collects recent innovative original research and review articles on subtopics of mechanistic insights into bioactivities, treatment of diseases, profiling, extraction and identification, and biotechnology.

Global dietary recommendations emphasize the consumption of plant-based foods for the prevention and management of chronic diseases. Plants contain many biologically active compounds referred to as phytochemicals or functional ingredients. These compounds play an important role in human health. Prior to establishing the safety and health benefits of these compounds, they must first be isolated, purified, and their physico-chemical properties established. Once identified, their mechanisms of actions are studied. The chapters are arranged in the order from isolation, purification and identification to in vivo and clinical studies, thereby covering not only the analytical procedures used but also their nutraceutical and therapeutic properties.

The opening chapter of *Phytochemicals: Plant Sources and Potential Health Benefits* discusses macronutrients and micronutrients from plants along with their benefits to human health. An overview of the mechanisms of action underlying the potential roles of dietary soybean isoflavones including daidzein, genistein, and equol that may have benefits in dyslipidemia, ischemic heart disease, blood pressure, diabetes, cancer, and osteoporosis is discussed in the next chapter. In one study, the authors seek to scientifically validate the hypoglycaemic effects of crude aqueous extracts from *Vitex paysonis* fruits on both normal and alloxan-induced diabetic rats. Additionally, the authors discuss the literature results obtained in the identification and quantification of rosmarinic acid and its derivatives in Lamiaceae family plants, as well as explore recent advances in the nanoencapsulation of rosmarinic acid. This compilation goes on to report several aspects of the chemical composition and biological activity of species of *Smilax* found in Brazil. *Smilax fluminensis* is a dioecious liana with a great capacity for shoot formation in soil and primary branch formation in subsoil. As such, phytochemical studies on this plant are reviewed. Phytochemical aspects and biological activities of the species *S. brasiliensis* are also examined. To continue the discussion, the authors investigate the allelopathic, cytotoxic, genotoxic and larvicidal potential of methanol and petroleum ether extracts from *S. brasiliensis* leaves, as well as the effects of their fatty acids and methyl esters. Furthermore, the authors synthesize phytochemical aspects and biological activity of *Tecoma stans* (L.) species. In the penultimate chapter, the authors discuss *P. venusta*, and the way in which compounds obtained from this plant can be used as functional foods, drugs or precursors for the semi-synthesis of drugs. The objective of the concluding chapter is to present the ethnopharmacological, biological activities and phytochemical aspects of the *Limoniastrum feei* species growing in the Algerian Sahara.

The current volume, "Medicinal and Aromatic Plants of the Middle-East" brings together chapters on selected, unique medicinal plants of this region, known to man since biblical times. Written by leading researchers and scientists, this volume covers both domesticated crops and wild plants with great potential for cultivation. Some of these plants are well-known medicinally, such as opium poppy and khat, while others such as *Apharsemon* and citron have both ritual and medicinal uses. All have specific and valuable uses in modern society. As such, it is an important contribution to the growing field of medicinal and aromatic plants. This volume is intended to bring the latest research to the attention of the broad range of botanists, ethnopharmacists, biochemists, plant and animal physiologists and others who will benefit from the information gathered therein. Plants know no political boundaries, and bringing specific folklore to general medical awareness can only be for the benefit of all.

Both Asia and Africa are home to many plants that can be used for the treatment of many diseases and their medicinal properties are gaining interest in western societies. Medicinal plants from Asia and Africa are used for their healing abilities and also have a symbolic meaning in communities. The importance of traditional autochthonous plant remedies plays a crucial role in the health of millions of people of these two continents. Even today, traditional medicine represents the dominant medical system for millions of people showing a significant impact on health care practices. Therefore, traditional operators still represent a vital part of regional healthcare systems. For this reason, pharmaceutical industries consider traditional medicine as a source for the identification of bioactive compounds that can be used in the preparation of synthetic drugs. *Biologically Active Natural Products from Asia and Africa: A Selection of Topics* guides the reader to information about new natural products from these regions and the different

ways to use them to treat or alleviate many of the most common diseases. The volume presents nine topics covering a number of facets of natural product medicine including: - pharmaceutical analysis of anti-diabetic herbal medicines from Bangladesh and local retailers - caffeine intake and the risk of female infertility - pharmaceutical analysis of *Urena sinuata* (bur mallow) - anti-CHIKV activities of diterpenes and their derivatives - anti-inflammatory nanogel for the treatment of psoriasis - antilithiatic properties of Moroccan medicinal plants - ethnobotanic, phytochemical and biological activities of *Aristolochia longa* L. (pipevine) - wound healing potential of combined extracts of stem bark and leaves of *Sphenocentrum jollyanum* (an African shrub) This is a handy reference for specialists and R&D experts in pharmaceutical chemistry who wish to be informed about current knowledge on developing natural remedies in Asia and Africa.

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