

## Total Phenolic And Total Flavonoids Content Of Pitaya

This comprehensive reference consolidates current information on the antioxidant properties of wheat, their beneficial effects, the mechanisms involved, factors affecting availability/bioavailability, and the methods used to measure them. It discusses antioxidant properties of wheat grains and fractions and their phytochemical compositions and covers the effects of genotype, growing conditions, post-harvest treatment, storage, and food formulation and processing on availability/bioavailability. Wheat Antioxidants will help cereal chemists, food technologists, food processors, nutritionists, and others maximize the health benefits of wheat-based foods.

Residues from the processing of fruits and vegetables which are traditionally considered an environmental problem is now widely recognized for obtaining high-phenolic products. This paper was designed to study the total phenolic and total flavonoids contents in the pitaya peels. The total phenolic content was determined by using the Folin-Ciocalteu assay while the total flavonoids was measured using aluminum chloride colorimetric assay by UV-visible spectrometer. The result showed that the highest total phenolic content in pitaya peels was extracted at the optimum dose of aluminum sulfate concentration of 25 mg/L (3.32 mg gallic acid equivalents (GAE)/ 25 g at 80oC, 3.21 mg GAE/25g at 60oC and 1.73 mg GAE/25g at 40oC). The greatest total flavonoids content in pitaya peels was extracted (2.24 mg catechin equivalents (CE)/25 g at 60oC, 1.79 mg CE/25g at 80oC and 1.60 mg CE/25g at 40oC) at the concentration of aluminum sulfate of 30 mg/L. The results showed that the value of the total phenolic content decreased when the concentration of aluminum sulfate of 25 mg/L due to the fact that the high concentration of aluminum sulfate (more than 25 mg/L) could have reacted with the phenolic compound of the pitaya peels to form another compound. The total flavonoid was found to be extracted with the highest value at temperature of 60oC and the lowest at 80oC. This shows that the flavonoids compound was somehow destroyed at temperature of 80oC. -Author-

Citrus fruits have long been popular around the world due to their good flavor, taste, high nutritional value, and their healthy properties. Citrus is well known as a rich source of vitamin C. Citrus fruits also contain many other functional bioactive phytochemicals including terpenoids, triterpenes, flavonoids, amino acids, phenolic acids, mineral constituents, and polysaccharides, which are beneficial to human health. Citrus fruits are generally recognized as an outstanding source of biologically active compounds related to both nutritional and nutraceutical values. *Phytochemicals in Citrus: Applications in Functional Foods* focuses on up-to-date information on chemical properties of citrus fruits, citrus food products, and their health benefits. The 16 chapters in the book provide a knowledge base on the chemical composition, bioactive components, biochemical properties, food use, and health benefits of citrus fruits. The information in this book will help readers to better understand the health benefits of citrus fruits and products and their dietary applications. The book is a unique reference for food science professionals engaged in functional foods and nutritional dietary management. The book can also serve as a handy reference for college and university students majoring in food science, nutrition, pharmaceutical science, and horticultural science.

The papers are arranged in eight sections, addressing: antimutagens in food; antimutagens and anticarcinogens in environmental toxicology; free radicals; antitumor initiators; antitumor promoters; aspects of mammalian and human genetics; molecular aspects of mutagenesis and antimutagenesis; and oncog

Total Phenolic and Total Flavonoids Content of Pitaya Peels by Water Extraction

From Inflammation to Biotechnology

Natural Sources, Importance and Applications

Phytochemicals in Citrus

Antioxidant Activity of Extracts of Swertia Chirata

Beekeeping in the United States

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.

Until recently, breeding efforts in mass produced food crops centered on high yield production, yet sacrificed flavor, taste, and other qualities. Now, more emphasis is being placed on the enhancement of nutritional and medicinal properties as well as from an environmental impact and sustainability standpoint. This volume looks at the use of crops 2008 NOMINEE The Council on Botanical and Horticultural Libraries Annual Award for a Significant Work in Botanical or Horticultural Literature From medicinal, industrial, and culinary uses to cutting-edge laboratory techniques in modern research and plant conservation strategies, *Natural Products from Plants, Second Edition* reveals a vastly expanded understanding of the natural products that plants produce. In a single volume, this book offers a thorough inventory of the various types of plant-derived compounds. It covers their chemical composition, structure, and properties alongside the most effective ways to identify, extract, analyze, and characterize new plant-derived compounds. The authors examine new information on the chemical mechanisms plants use to deter predators and pathogens, attract symbiotic organisms, and defend themselves against environmental stress—insights which are key for adapting such mechanisms to human health. Along with updated and revised information from the highly acclaimed first edition, the second edition presents seven new chapters and features more than 50% new material relating to plant constituents, natural product biochemistry, and molecular biology. The book incorporates in-depth treatment of natural product biosynthesis with new collection and extraction protocols, advanced separation and analytical techniques, up-to-date bioassays, as well as modern molecular biology and plant biotechnology for the production of natural products. Unique in its breadth and coverage, *Natural Products from Plants, Second Edition* belongs on the shelf of interested researchers, policymakers, and consumers—particularly those involved in disease prevention, treatment, and pharmaceutical applications—who need a complete guide to the properties, uses, and study of plant natural products.

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.

Phytochemical Dictionary

A Study of Major Flavonoid Compounds and Analysis of Total Phenols, Total Flavonoids, and Antioxidant Activity in the Leaves, Stems, Roots, and Flowers of *Sesbania Grandiflora*

Studies of Phytochemicals Properties and Antioxidative Activity of Perlis Sunshine Mango Seed Extract

Medicinal Plants in Nepal

Natural Products from Plants, Second Edition

Macro To Nano Spectroscopy

**Phenolic compounds, one of the most widely distributed groups of secondary metabolites in plants, have received a lot of attention in the last few years since the consumption of vegetables and beverages with a high level of such compounds may reduce risks of the development of several diseases. This is partially due to their antioxidant power since other interactions with cell functions have been discovered. What's more, phenolic compounds are involved in many functions in plants, such as sensorial properties, structure, pollination, resistance to pests and predators, germination, processes of seed, development, and reproduction. Phenolic compounds can be classified in different ways, ranging from simple molecules to highly polymerized compounds. Phenolic Compounds in Food: Characterization and Analysis deals with all aspects of phenolic compounds in food. In five sections, the 21 chapters of this book address the classification and occurrence of phenolic compounds in nature and foodstuffs; discuss all major aspects of analysis of phenolic compounds in foods, such as extraction, clean-up, separation, and detection; detail specific analysis methods of a number of classes of phenolic compounds, from simple molecules to complex compounds; describe the antioxidant power of phenolic compounds; and discuss specific analysis methods in different foodstuffs.**

**In addition to covering thoroughly the core areas of physical organic chemistry -structure and mechanism - this book will escort the practitioner of organic chemistry into a field that has been thoroughly updated.**

**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 mainly with animal tissues. 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 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.

This new edition of the book by Jean Bruneton has been revised and expanded by over 200 pages, to reflect the most recent advances (natural or semisynthetic substances) as well as the most recent contributions to the therapeutic arsenal (antimalarial, antitumor, or antiretroviral agents). Building upon biosynthetic relationships, the author describes the different classes of metabolites and the drugs that produce them. Organized in four parts (primary metabolites, phenolics, shikimates and acetates, terpenes and steroids, alkaloids), the book develops for each class, phytochemical generalities, distribution, biosynthesis, extraction and quantitation methods, and biological aspects. For each raw material, it presents the origin, identity, production, composition, uses, processing and optimization: thus a considerable amount of botanical, chemical, analytical, pharmacological and therapeutic data is gathered into a particularly coherent compilation, for each product, the therapeutic indications and recommended usage are specified. An extensive index (about 3 000 entries) and nearly 500 recent references represent a valuable starting point for the reader's own literature research. This encyclopedia of pharmacognosy and phytochemistry is written for students, educators and professionals using plant resources in pharmacy, cosmetology, perfumery, botany, food technology and other fields.

## **Economic Botany**

### **Plants and People of Nepal**

#### **What's New About Crop Plants**

#### **Preliminary Evaluation of Antioxidant Compounds and Antioxidant Capacity of 15 Cultivars of Sweet Potato (*Ipomoea Batatas*) and Sweet Potato Fries**

#### **A Guide to Modern Techniques of Plant Analysis**

#### **Antioxidant & Inhibitor Corrosion Of *Ptychotis Verticillata***

*ABSTRACT: Total phenolic content, total flavonoid content, and the antioxidant activity of the methanolic extracts of the leaves, stems, roots, and flowers of *Sesbania grandiflora* were evaluated. The presence of different classes of flavonoids was also analyzed using liquid chromatography-mass spectrometry (LC-MS). Phenolic compounds and flavonoids are of great importance due to their natural health promoting effects to the human body. The different vegetative and reproductive extracts of the plant did not exhibit extremely high levels of phenolic or flavonoid content with the leaves containing the maximum amounts. The flavonoid aglycone quercetin was found in all the organs whereas kaempferol was exclusively detected in the leaves. All the organs showed antioxidant activity with the flowers being the most potent despite having lower phenolic content and flavonoids compared to the leaves. The study did not find any correlation between phenolic content, flavonoid content, and antioxidant activity. The findings indicate that other classes of bioactive compounds present in the extracts may be playing a role in the antioxidant potential of the extracts. The results also point out to the fact that reproductive tissues may follow different trends in terms of phytochemicals synthesized and bioactivities.*

*Advances in the flavonoid field have been nothing short of spectacular over the last 20 years. While the medical field has noticed flavonoids for their potential antioxidant, anticancer and cardioprotectant characteristics, growers and processors in plant sciences have utilized flavonoid biosynthesis and the genetic manipulation of the flavonoid pa*

*The goal of this study was to screen different extracts of medicinal plants for their phenolics profile and antioxidant activities. Antiradical properties of the plant extracts were compared using stable DPPH . Generally, ethanolic extracts had the strongest antiradical activities followed by ethyl acetate and finally hexane extracts. The ethanolic extracts of different plants were also markedly effective in inhibiting the oxidation of linoleic acid and the subsequent bleaching of -carotene in comparison with the control. The content of phenolic compounds (mg/g) in different extracts expressed in gallic acid equivalents (GAE), varied between 1.2 and 15.3. In all plant samples ethanolic extracts contained the highest levels of total phenolics and total flavonoids followed by ethyl acetate extracts and finally hexane extracts. The results are important for using those plants in different food and*

*pharmaceutical applications.*

*With contributions that review research on this topic throughout the world, Oxidative Damage to Plants covers key areas of discovery, from the generation of reactive oxygen species (ROSs), their mechanisms, quenching of these ROSs through enzymatic and non-enzymatic antioxidants, and detailed aspects of such antioxidants as SOD and CAT. Environmental stress is responsible for the generation of oxidative stress, which causes oxidative damage to biomolecules and hence reduces crop yield. To cope up with these problems, scientists have to fully understand the generation of reactive oxygen species, its impact on plants and how plants will be able to withstand these stresses. Provides invaluable information about the role of antioxidants in alleviating oxidative stress Examines both the negative effects (senescence, impaired photosynthesis and necrosis) and positive effects (crucial role that superoxide plays against invading microbes) of ROS on plants Features contributors from a variety of regions globally*

*The Genus Mentha*

*Mint*

*Modern Physical Organic Chemistry*

*Phenolics in Food and Nutraceuticals*

*Applications in Functional Foods*

Contributed papers presented at the National Seminar on Sustainable Use of Biological Resources, organized by Ecological Society in collaboration with Institute of Forestry and Prithwi Narayan Campus at Pokhara on April 22-23, 2007.

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.

Decades of firsthand study of the ethnobotanical riches of Nepal's flora and the human uses thereof, including field research in all 75 districts of Nepal.

Research in extracting colour from natural fruits has been actively conducted nowadays. In this research, red pitaya peels was selected as a raw material. Red pitaya peels was selected because of red pitaya easily find in local market and its can reduce waste production in the world, which is environmental friendly. This research is to analyze the total phenolic contents and total flavonoids from red pitaya peels. Its also analyze the effect of the different solvents to the production of natural color from red pitaya waste. Four different solvents: n-hexane, ethanol, propanol and acetone has been used in extracting total phenolic contents and total flavonoid from red pitaya waste. Three different parameter of ultrasonic extractor (25, 68, 132 kHz) were used in extracting red pitaya peels with four solvents respectively. The analysis was conducted in University Malaysia Pahang laboratory using the ultraviolet-visible spectrophotometry. Most

important step in this research is the analysis of total phenolic and total flavonoid contents for twelve samples. Based on the result of this research, the best solvent for total phenolics and flavonoids from red pitaya waste is ethanol, followed by propanol and acetone. This is due to the highest polarity of ethanol. On the other hand, n-hexane extracts show the lowest total phenolic and flavonoids contents. 132kHz ultrasonic extractor extracts more total phenolic and flavonoids contents, followed by 68kHz and 25kHz ultrasonic extractor. As a conclusion, the highest polarity of the solvents and frequency extract more color pigments, total phenolic and flavonoids from red pitaya waste.

Phenolic Compounds in Food

An Anthology of Contemporary Research

A Handbook of Bioactive Compounds from Plants, Second Edition

Antioxidant Networks and Signaling

Biological Activity

Essential Oils and Solvent Extracts of *Ptychotis Verticillata* from Morocco

**"Oxidative stress and inflammatory cell death / tissue damage have been implicated in a wide array of human diseases, including cancer, neurodegenerative diseases, diabetes, inflammatory joint diseases,; cardiovascular dysfunctions as well as ageing. Oxidative stress mediates the activation of transcription factors such as NF- $\kappa$ B that, in turn, induce the transcription of certain genes promoting cytokine production. Release of these cytokines results in the enhancement of inflammatory responses and activation of endothelial cells in distant organs. The inflammatory cascade is then triggered by the induction of adhesion molecules and the generation of cytokines and other inflammatory mediators. Given that reactive oxygen and nitrogen species (ROS and RNS respectively) generated by infiltrated neutrophils into distant organs act directly as noxious agents reacting with molecular components, thereby enhancing inflammatory processes and therefore influencing cell viability, ROS and RNS have become potential therapeutic targets for prophylactic biofactors. Whilst their production by phagocytic cells is, of course, essential for the eradication of invading pathogens, and the capacity of selected chemotherapeutic agents to generate such species in specific 'target' cells is well known in cancer research, the novel therapeutic actions and potential mechanisms of action of ozone as a microbicidal agent in clinical dentistry are now being advocated. The focus of this publication prominently encompasses the pivotal roles of ROS and RNS in the pathogenesis of many clinical conditions (together with their involvement in the ageing process of lower (yeast) cells, and higher organisms including plants), and discusses the potential applications of dietary-derived antioxidants to interfere with the biomolecular mechanisms of these processes and hence offer realistic therapeutic or prophylactic potentials."**

**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

**Phenolics in Food and Nutraceuticals** is the first single-source compendium of essential information concerning food phenolics. This unique book reports the classification and nomenclature of phenolics, their occurrence in food and nutraceuticals, chemistry and applications, and nutritional and health effects. In addition, it describes antioxidant a

The critically acclaimed laboratory standard for more than forty years, **Methods in Enzymology** is one of the most highly respected publications in the field of biochemistry. Since 1955, each volume has been eagerly awaited, frequently consulted, and praised by researchers and reviewers alike. Now with more than 300 volumes (all of them still in print), the series contains much material still relevant today-truly an essential publication for researchers in all fields of life sciences. This volume presents an extensive collection of new methodologies to aid progress in solving unanswered questions concerning the bioavailability and metabolism of flavonoids and polyphenols, their biochemical and molecular biological effects on cell regulation, and their effects on health. Major topics in this volume include sources, characterization, analytical methods, bioavailability, antioxidant action, and biological activity.

**Pharmacognosy, Phytochemistry, Medicinal Plants (2e ed. - retirage broch")**

**Antimutagenesis and Anticarcinogenesis Mechanisms II**

**Characterization and Analysis**

**Effect of Extraction Solvents on Total Phenolic and Total Flavonoids Contents and Antimicrobial Activities of Euphorbia Hirta and**

**Centranthera Tranquebarica**

**A Role for Antioxidants**

**Traditional Medicinal Plants**

This thesis examines the total phenolics compounds (TPC), total flavonoids compounds (TFC), reducing potential, free radical scavenging, protein, percent carbon, pH, color, and percent sugar of 15 cultivars of sweet potato. Three cultivars of sweet potato fries were also examined for total phenolics, flavonoids, antioxidant capacity, and lipid oxidation during the process. Overall, the results show that TFC is significantly correlated with the free radical scavenging ability (DPPH) and TFC but TPC is not. The baking procedure made sweet potato pulp greener. The pH of 15 cultivars of sweet potato ranged from 5.75 to 6.73 and the percent sugar ranged from 16% to 30%.

Considering its total phenolic compounds, total flavonoids compounds and antioxidant capacity, cultivar 538347 is the best cultivar for planting in the Athens, Ohio region.

A vast array of natural organic compounds, the products of primary and secondary metabolism, occur in plants. This dictionary provides basic information, including structural formulae, on plant constituents. It profiles over 3000 substances from phenolics and alkaloids through carbohydrates and plant glycosides to oils and triterpenoids. For each s

In the last few decades, Spectroscopy and its application dramatically diverted science in the direction of brand new era. This book reports on recent progress in spectroscopic technologies, theory and applications of advanced spectroscopy. In this book, we (INTECH publisher, editor and authors) have invested a lot of effort to include 20 most advanced spectroscopy chapters. We would like to invite all spectroscopy scientists to read and share the knowledge and contents of this book. The textbook is written by international scientists with expertise in Chemistry, Biochemistry, Physics, Biology and Nanotechnology many of which are active in research. We hope that the textbook will enhance the knowledge of scientists in the complexities of some spectroscopic approaches; it will stimulate both professionals and students to dedicate part of their future research in understanding relevant mechanisms and applications of chemistry, physics and material sciences.

Master's Thesis from the year 2015 in the subject Biology - Botany, grade: -, , language: English, abstract: The inhibitory or delaying action of both the synthetic chemicals and naturally occurring phytochemicals against oxidative damage to tissues by free radicals produced in biological system of living organisms is known as antioxidant activity. Since some phytochemicals are responsible for biological as well as medicinal activities, nine wild orchids of Nepal were assessed for total polyphenolics and flavonoids content along with the antioxidant activity. The ethanolic extract of *Eria graminifolia* pseudobulbs, *Gastrochilus acutifolius* leaf and root, *G. distichus* whole plant, *Luisia trichorhiza* leaf and root, *Otochilus albus* pseudobulbs, *Papillionanthe uniflora* whole plant, *Pholidota articulata* leaf and pseudobulbs, *Rhynchosstylis retusa* leaf, and *Trudelia cristata* leaf and stem were prepared by Soxhlet extraction. Phytochemicals were detected by previously established protocols with minor modifications. The total flavonoids were estimated with aluminium chloride method and total polyphenolics content with Folin-Ciocalteu phenol reagent method. Antioxidant activity was assessed by DPPH (2, 2-diphenyl-1-picrylhydrazyl) free radical scavenging assay. There was significant variation of total flavonoids, total polyphenolics content and antioxidant activity among the orchid extracts at  $P = 0.05$ . The total flavonoids varied with highest in *Rhynchosstylis retusa* leaf ( $110.68 \pm 4.52$  mg QE/g) and lowest content in *Gastrochilus acutifolius* root ( $22.32 \pm 1.10$  mg QE/g); total polyphenolics with highest in *Trudelia cristata* stem ( $69.68 \pm 2.78$  mg GAE/g) and lowest content in

Gastrochilus acutifolius leaves ( $11.89 \pm 0.64$  mg GAE/g). Also, the antioxidant activity varied with highest in Trudelia cristata stem (IC<sub>50</sub> 79.69  $\mu$ g/ml) and lowest DPPH radical scavenging activity in Gastrochilus acutifolius leaf (IC<sub>50</sub> 341.79  $\mu$ g/ml). However, none of the orchid extracts were as effective as quercetin - the reference compound - in radical scavenging activity (IC<sub>50</sub> 32.90  $\mu$ g/ml). Total polyphenolics and flavonoids content and antioxidant activity of selected orchid extracts in this study were higher or lower than medicinal plant and orchid extracts of previous studies with considerable margin. Again, their antioxidant activity was positively associated with total flavonoids and total polyphenolics content. [...]

Chemistry, Biochemistry and Applications

Antioxidant Activity of Selected Wild Orchids of Nepal

In Vivo and in Vitro Concepts

Wheat Antioxidants

A Textbook of Useful Plants and Plant Products

Phenolic Compound Biochemistry

### **Total Phenolic and Total Flavonoids Content of Pitaya Peels by Water Extraction**

**Plants have been an important source of medicine for thousands of years. Plants are rich source of natural antioxidant i.e. tocopherols, vitamin C, flavonoids and phenolic compounds. Whole plant samples of Swertia chirata were purchased from the local market of Faisalabad, Pakistan. The dried and ground sample subjected for extraction by shaking method with different solvents i.e. 75% methanol and ethanol. In the present study antioxidant activity of plant Swertia chirata was investigated by measuring total phenolics (TPC), total flavonoids (TFC), DPPH (2, 2-Diphenyl-1-picrylhydrazyl) and Percent inhibition of linoleic acid peroxidation. The total phenolics (TPC) obtained from methanol 2.565g / 100g from ethanol 1.612g / 100g gallic acid equivalents. TFC obtained from methanol 13.247g / 100g from ethanol 10.948g / 100g catechin equivalents, inhibition of linoleic acid peroxidation obtained from methanol 94.04% from ethanol 93.05% and Percentages scavenging of plant Swertia chirata obtained from methanol extract 84.32% from ethanol extract 82.54%.**

**Mango seeds contain high content of antioxidants, phenolic and flavonoid. The usage of mangoes can convert the waste into a bountiful harvest. The aim of this study was to analyze the phytochemicals properties in Perlis SunShine mango. In addition, the objective of this study was to investigate the antioxidant activity of the extract of Perlis SunShine mango. Perlis SunShine mango is dried and crushed before they are mixed with a variety of organic solvents (methanol, ethanol, acetone and distilled water). After that, the Perlis SunShine mango seed extract was analyzed and tested to determine the phytochemicals, antioxidant activity, total flavonoids and phenolic content. After the phytochemical analysis is conducted, the results show methanol gave the highest of phytochemical constituent. Next, by using Ultra-Violet Spectrophotometer, the antioxidant activity, total phenolic and flavonoid**

**content are determined. It is found that the methanol gives the highest yield for antioxidant activity and total flavonoid content and total phenolic content. But in order to be commercial in the food, pharmaceutical, nutraceutical or cosmetic industries, the Perlis SunShine mango seed that extracted with distilled water is chosen since it is preferable, chemical-free and safe.**

**Functional Food Ingredients from Plants, Volume 90, the latest release in the Advances in Food and Nutrition Research series, provides updated knowledge about nutrients in foods and how to avoid their deficiency, especially for those essential nutrients that should be present in the diet to reduce disease risk and optimize health. Updates to this release include sections on Natural antioxidants of plant origin, Dietary fiber sources, The impact of molecular interactions with phenolic compounds on food polysaccharides functionality, Plant phenolics as functional ingredients, Pigments and vitamins from plants as functional ingredients, Glucosinolates fate from plants to consumer, and more. Contains contributions that have been carefully selected based on their vast experience and expertise on the subject Includes updated, in-depth, and critical discussions of available information, giving the reader a unique opportunity to learn Encompasses a broad view of the topics at hand**

**Free Radicals in Biology and Medicine**

**Functional Food Ingredients from Plants**

**Analysis of Phenolic Acids and Flavonoids in Honey**

**Total Phenolic Content and Total Flavonoid of H.Polyrhizus Waste Extract**

**by Using Ultrasonic Solvents Extraction**

**Antioxidant Methodology**

**Phenolic Compounds**

**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.**

**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.**

**Novel Discoveries of the 21st Century**

**Phytochemical Methods**

***Flavonoids***

***Total Phenolic Content and Antioxidant Activity of Flavonoids Isolated from Leaves of Selected Citrus Species***

***Oxidative Stress and Chronic Degenerative Diseases***

***Flavonoids and Other Polyphenols***