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Oxidative Stress and Chronic Degenerative Diseases A Role for Antioxidants BoD – Books on Demand 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. **Phenolic Compounds Biological Activity BoD – Books on Demand** 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. **Phenolic Compounds Natural Sources, Importance and Applications BoD – Books on Demand** 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. **A Comprehensive Study of Phenolics and Peptides from Three Legume Varieties** Lentil, black soybean and black turtle have been proved to be phenolic-rich legume varieties and possess higher antioxidant activity. In this study, the three legume varieties were subjected to broad range of processing conditions, and the effects on phenolic contents, antioxidant capacity and individual phenolic acid were investigated. The results showed all processing methods could decrease the total phenolic content, and steaming processing could preserve more phenolics and antioxidant activity than boiling processing. Phenolic acids mainly existed in non-free form and the content of individual free phenolic acids was dependent on the thermal process applied. When in vitro gastrointestinal simulation digestion was applied to the thermally processed beans, it was found that the properties of hydrolysates including total phenolic content, antioxidant activity, degree of hydrolysis, and ACE (angiotensin converting enzyme) inhibitory activity were all affected by thermal conditions employed. There was a weak correlation between the degree of hydrolysis and ACE inhibition. In the current study, for each legume variety, cooking conditions which yielded the highest phenolic content and antioxidant activity were selected. Phenolics of the raw and cooked seeds from each legume variety were extracted, semi-purified (XAD-7) and further fractionated (Sephadex LH-20). The results showed cooking had great effects on yield, phenolic content, antioxidant capacity, and individual phenolic compounds. The phenolic content and antioxidant activity could be enriched tremendously in the semi-purified extracts and some fractions. Some phenolic compounds which were absent in raw material could be found after cooking in the fractions and some phenolic compounds which were present in raw material disappeared after cooking. Among crude phenolic extracts, semi-purified extracts and fractions, only crude extracts showed ACE inhibition. In addition, protein isolates from the legumes varieties were treated with in vitro GI (gastrointestinal) digestion and then separated by ultrafiltration, DEAE anion exchange chromatography and gel permeation chromatography. After ultrafiltration, the lowest molecular weight fraction (**Antioxidant Activity and Phenolic Compound of Raw and Processed Cashew Nuts Phenolic Antioxidants and Health Benefits Scientific Publishers** 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. **Total Phenolic Content and Antioxidant Activity of Some Malaysian Herbs** Herbs have drawn much attention of people worldwide, not only because of their economic value as food products, but also for their antioxidant

compounds. Thus, this study was conducted to investigate the total phenolic content and antioxidant activities on three Malaysian herbs by using Soxhlet extraction method. The herbs were Eugenia polyantha (Serai kayu), Euodia redlevi (Tenggek burung) and Limnocharis flava (Sudu itik). The total phenolic content and antioxidant compounds were extracted using distilled water at three different extraction time (4, 8 and 12 hour). The extracts were then evaluated using Folin-Ciocalteu reagent for their total phenolic content and 2, 2-Diphenyl-1-picrylhydrazyl hydrate (DPPH) assay for their antioxidant compounds. Further analyzed was done using HighPerformance Liquid Chromatography (HPLC) to further verifying the ascorbic acid existence in the extracts. It was found L. flava showed the highest content of total phenolic compounds (15.01 mg gallic acid equivalent (GAE) per 1 g of sample) with the antioxidant capacity standing at 20.42 mg ascorbic acid equivalent (AAE) per 1 g of sample after 8 hour extraction. While, E. polyantha showed the highest value of antioxidant capacity (21.19 mg AAE/g) with total phenolic content of 9.99 mgGAE/g. In HPLC analysis, it was found that E. polyantha and L. flava after 8 hour extraction contained 0.7625 and 0.9745 mg AAE/g of ascorbic acid respectively. **Evaluation of Total Phenolic Content and Antioxidant Activity of Canola Grown in the North Central Region of North America Effect of Cooking on Total Phenolic Content and Antioxidant Activity in Selected Foods Varietal Differences in Antioxidant Activity and Phenolic Composition of Asparagus Quantification of Total Phenolic Content and Antioxidant Activity of Oat Cultivars Grown in South Dakota Phenolic Compounds of Cranberry Genotypes and Their Antioxidant Capacities and Bioactivities** Cranberry species are a rich source of natural antioxidants with potential health benefits linked to the prevention of certain chronic and degenerative diseases. This study compared the antioxidant activity of phenolic constituents of five different cranberry genotypes (pilgrim, wild clone NL2, wild clone NL3, wild clone PEI, wild clone NL1) and market samples. Phenolic constituents were separated into free, esterified and bound fractions, the content of each fraction as well as that of their flavonoid counterparts and antioxidative efficacy were evaluated. The latter was assessed using trolox equivalent antioxidant capacity (TEAC), oxygen radical absorbance capacity (ORAC), 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging capacity (DRSC), hydroxyl radical scavenging capacity and reducing power (RP) as well as metal chelation assays. Among cranberry varieties, pilgrim genotype showed the highest phenolic content (30.02 mg of gallic acid equivalents (GAE)/g dried fruit weight). Similarly, pilgrim had the highest flavonoid content (19.94 mg of catechin equivalents (CE)/g of dried fruit weight). The phenolic compounds in cranberry were predominantly present in the esterified and free forms in the pilgrim and wild clone NL2. In addition, results showed that contribution of esterified phenolics to the antioxidant activity, metal chelating and reducing power was higher than the free and bound phenolics for all tested cranberry genotypes. HPLC-MS analysis was performed for two of the rich sources of phenolics and antioxidant activity. For these, the results showed that caffeic acid, p-coumaric acid, epicatechin, proanthocyanin trimer A-type, proanthocyanin dimer B-type and quercertin 3-O-glucoside predominated in wild clone NL2, while chlorogenic, caffeic acid, epicatechin, proanthocyanidin dimer B-type, proanthocyanin trimer A-type and myricertin 3-O-arabinoside were predominant in pilgrim. **Total Phenolic Content and Antioxidant Activity of Flavonoids Isolated from Leaves of Selected Citrus Species Measurement of Antioxidant Activity and Capacity Recent Trends and Applications John Wiley & Sons** A comprehensive reference for assessing the antioxidant potential of foods and essential techniques for developing healthy food products Measurement of Antioxidant Activity and Capacity offers a much-needed resource for assessing the antioxidant potential of food and includes proven approaches for creating healthy food products. With contributions from world-class experts in the field, the text presents the general mechanisms underlying the various assessments, the types of molecules detected, and the key advantages and disadvantages of each method. Both thermodynamic (i.e. efficiency of scavenging reactive species) and kinetic (i.e. rates of hydrogen atom or electron transfer reactions) aspects of available methods are discussed in detail. A thorough description of all available methods provides a basis and rationale for developing standardized antioxidant capacity/activity methods for food and nutraceutical sciences and industries. This text also contains data on new antioxidant measurement techniques including nanotechnological methods in spectroscopy and electrochemistry, as well as on innovative assays combining several principles. Therefore, the comparison of conventional methods versus novel approaches is made possible. This important resource: Offers suggestions for assessing the antioxidant potential of foods and their components Includes strategies for the development of healthy functional food products Contains information for identifying antioxidant activity in the body Presents the pros and cons of the available antioxidant determination methods, and helps in the selection of the most appropriate method Written for researchers and professionals in the nutraceutical and functional food industries,academia and government laboratories, this text includes the most current knowledge in order to form a common language between research groups and to contribute to the solution of critical problems existing for all researchers working in this field. **Total flavonoid content, total phenolic content and antioxidant activity of various of extract of etlinger elatior Antioxidant Capacity and Phenolic Profiles of Lentils as Affected by Processing** Lentils are excellent sources of dietary fibre, carbohydrates, proteins, various vitamins, minerals, and bioactive compounds such as phenolic compounds. Epidemiological studies have reported their effects in lowering cholesterol and reducing the incidence of colon cancer, cardiovascular diseases, and type-2-diabetes. In the present study, effects of germination, hydrothermal (boiling) treatment, and dehulling on the antioxidant capacity of soluble- and insoluble-bound phenolics of lentils were examined. Upon germination, an increasing trend in the antioxidant capacity in the insoluble-bound phenolics (IBPs) and a declining trend in that of the soluble phenolics (except total phenolic contents) were observed during 4 days of germination. Based on the results, a new indicator, the ratio of insoluble-bound phenolics to soluble phenolics (SPs), was suggested as an effective means to monitor changes in the antioxidant activity of lentils during germination. The hydrothermal/boiling process also led to important findings. As expected, the hydrothermal process decreased the content of insoluble-bound phenolics in the lentil cultivars tested due to the release of bound phenolics from cell wall matrices. Interestingly, the decrease of bound phenolics was not proportionally reflected in the increase of soluble phenolics, possibly due to the loss of phenolics during the hydrothermal process via interaction with proteins and other seed components. Among lentil cultivars used, the hulls of 3494-6 showed the most effective antioxidant potential, while Maxim displayed the lowest in most measurements. Meanwhile, the dehulling process revealed the predominant distribution of phenolics in the hulls as compared to the dehulled grains, as observed for both soluble- and insoluble-bound phenolics of lentils in their antioxidant potential and inhibitory activities against oxidation of LDL cholesterol and DNA strand breakage. In the HPLC-ESI- MSN analysis, different classes of soluble phenolics

such as phenolic acids, flavonoids, and proanthocyanidins were found in the hulls of all four tested lentil cultivars examined. The insoluble-bound phenolics has often been ignored in many evaluations by different research groups and hence this work has expanded the depth of knowledge in the field of food phenolics. **Determination of Total Antioxidant Activity and Phenolic Content of Aqueous and Organic Extracts of Citrus Fruits Phenolic and Polyphenolic Compounds of Wheat (Triticum Spp.) Extraction and Antioxidative Properties Effect of Extraction Parameters on Total Phenolic Content and Antioxidant Activity of Kesum Leaves Extract Determination of Total Phenolic Content and Antioxidant Activity of Water and Methanol Extracts of Rhaphidophora Decursiva (Roxb.) Schott Leaves The Effect of Different Infusion Conditions on Total Phenolic Content and Antioxidant Activity of Lemongrass (Cymbopogon Citratus) Phenolic Content and Antioxidant Activity of Selected Spices Effect of Different Types of Solvent on Extraction of Phenolic Compounds from Cosmos Caudatus** The preliminary screening indicated that Cosmos caudatus had extremely high antioxidant capacity. The antioxidant activity of most of the plant produced is mainly due to the presence of phenolic compounds. Among the phytochemicals, phenolic compounds are the main contributor of antioxidant activity in plant extracts due to their higher value in total phenolic content. The purpose of this study is to investigate the effect of different types of solvent with 50%, 70% and 100% concentration of each solvent on extraction of phenolic compounds from Cosmos caudatus. The soxhlet extractor was used in this study. Total phenols in the extract was determine using Folin-Ciocalteu (FC) assay. From the results, 100% ethanolic extract showed the highest of total phenolic content with 15.61 mgGAE/g. However the antioxidant activity was only 14.15%. Meanwhile, 70% acetone extract exhibited the highest inhibition of DPPH. The value obtained was 7.77 mgAAE/g with the antioxidant activity of 84.78%. The polarity of the solvent affects the efficiency of the extraction, total phenolic content and antioxidant activity of the obtained extracts. Total phenolic content is not the only contributor to its antioxidant activity. The existence of other components in fresh extract such as enzymes and vitamin may directly react with free radicals in addition to polyphenolic compound. Further research is warranted to explore the individual or major polyphenolic groups and other bioactive compounds in the Cosmos caudatus. **Phenolic Content and Antioxidant Activity of South African Sorghums and of Flours and Cookies Made from Them** Amongst cereals, sorghum is one of the major sources of phenolic compounds. South African cultivars have not been profiled for their phenolic content and antioxidant activity to highlight their potential benefits. Thus, South African sorghum cultivars representing different sorghum types were evaluated for total phenolic content, condensed tannin content and antioxidant activity and the effect of cultivar on their antioxidant activity. The presence of phenolic antioxidants in the different sorghum cultivars, created an opportunity to develop a sorghum product as a vector of the antioxidants. Cookies were a product of choice due to their shelf stability and high nutrient density. Sorghum cookies were produced from 70%, 90% and 100% extraction rate flours. The effects of flour extraction rates and cultivar on the total phenolic content, condensed tannin content and antioxidant activity of the cookies were determined. Consumer sensory evaluation was used to evaluate sorghum cookie acceptability against a wheat flour cookie. Total phenolic content of the cultivars, determined by the Folin-Ciocalteu method was 0.20 to 1.42 g catechin equivalents (CE)/100 g. The total phenolic content was 3 to 7 times higher in condensed tannin cultivars than in tannin-free cultivars. Using the modified Vanillin-HCl method, condensed tannins were only measurable in the condensed tannin cultivars. They ranged between 5.16 and 8.39 g CE/100 g. Subsequently, the antioxidant activity of the condensed tannin cultivars measured by the ABTS radical scavenging assay was up to 4 times higher than in the tannin-free cultivars. The high phenolic content and antioxidant activity of condensed tannin cultivars was attributed to the contribution of condensed tannins. Therefore, condensed tannin cultivars are a major source of antioxidants compared to tannin-free cultivars. For each sorghum cultivar, cookies of 100% extraction rate flours had 2 to 3 times higher total phenolics compared to those of 70% extraction rate flours, while antioxidant activity was 2 to 10 times higher. Cookies of the condensed tannin sorghum had 2 to 5 times more phenolics compared to those of condensed tannin-free sorghum. Antioxidant activity was 145 to 227? Mol Trolox equivalents (TE)/g in cookies of condensed tannin sorghum compared to 10 to 102? Mol TE/g in those of condensed tannin-free sorghum. Processing sorghum flours to cookies seemed to reduce phenolic and antioxidant activity, but considering the flour component in the formula, cookie antioxidant activity was slightly higher than that of flours. The texture of all sorghum cookies was less acceptable compared to that of wheat cookies. The consumers showed a slight overall liking of the condensed tannin-free sorghum and wheat flour cookies. The cookies from condensed tannin flours were neither liked nor disliked. Since generally wheat flour is used for making cookies, the similarities in the overall liking of the condensed tannin-free sorghum cookies and the wheat flour cookies indicate strong potential of sorghum flour for cookie making. Therefore, sorghum cookies have a potential as a functional ready-to-eat snack, with target consumers such as school children in feeding schemes to improve their health and nutrition status. **Investigating the Antioxidant Activity of Phenolics in Georgia Fruit Cultivars** This study offers a systematic characterization of the phenolic constituents in two Georgia-grown fruit species, and provides a better understanding of their antioxidative properties from both chemical and biological perspectives. Two representative fruit types, peaches and blackberries, were investigated due to their commercial and economic importance to the Georgia's agricultural sector. The research employed the chromatographic techniques of Sephadex LH-20 column chromatography and HPLC-MS to give a detailed characterization of the fruits' phenolic profiles both qualitatively and quantitatively. A number of new phenolic compounds in the extracts analyzed were elucidated by this study, some for the first time. The phenolic profiles also vary depending on various intrinsic and extrinsic factors including cultivar choice, geographic location, and time of harvest. Six Georgia-grown peach varieties were studied and cultivar-based differences were observed in terms of phenolic concentrations and antioxidant activities, with those requiring a longer period before harvest exhibiting greater antioxidant capacities. Two cultivars showing contrasting antioxidant capacities based on in vitro chemical assays, also exhibited a significant difference when the analysis was conducted on the basis of fresh weight in the two biological assays, namely cellular antioxidant activity (CAA) and anti-glycation assays. Procyanidins isolated from the extracts exhibited remarkable antioxidant capacity relative to the other phenolic classes present according to both chemical and biological assays. The U.S. Southeastern erect-type blackberry cultivars, released by the University of Arkansas breeding program, were found to possess a different total phenolics content and composition from those of Northwestern cultivars. Propelargonidin B-type dimer and ellagitannins were the dominant phenolics in these Georgia-grown berries, and appear to be responsible for significant antioxidant activity. **Total Flvavonoids, Phenolic**

Content and Antioxidant Activity of Various Crude Extract of Fibraurea Chloroleuca Identification of Purpurogallin in Brewed Beverages and Effect of Roasting on Antioxidant Activity and Phenolic Compounds in Coffees Coffee contains many antioxidants including purpurogallin, which is a hydrophobic phenolic antioxidant that is difficult to measure with reported methods. A method combining solid-phase extraction and liquid chromatography-mass spectrometry was developed to detect and quantify purpurogallin in brewed beverages, including coffee. For beverage preparation, water extraction was adopted for improved correlation with moka pot brewing. Purpurogallin was detected in all commercial coffee samples, and its content in ground coffees ranged from 455-630 ng/g dry weight. Purpurogallin was only detected in two English breakfast tea samples (335-360 ng/g dry weight) and was not detected in any cocoa sample. Antioxidant activity, total phenolic content, and phenolic profile of coffees with different degrees of roasting were determined and analyzed. The developed methodology was then further improved, and coffees with different roasting degrees were analyzed for their antioxidant activity, total phenolic content, and phenolic profile. The antioxidant activity ranged from 63.9-92.0 mg Trolox equivalents per gram of coffee (dry weight), and the total phenolic content ranged from 36.0-57.7 mg gallic acid equivalents per gram of coffee (dry weight). However, the total phenolic content was not correlated with the roasting degree ($p > 0.05$). When the roasting degree increases, chlorogenic acid decreases drastically, but shikimic acid, caffeic acid, gallic acid, pyrogallol, and purpurogallin increase correspondingly. The results suggest that purpurogallin is a common antioxidant in roasted coffees, and an increase in roasting degree will not only lead to dramatic breakdown of chlorogenic acid, but also promote significant formation of other phenolic compounds that can provide antioxidant activity. **Total Phenolic Content and Antioxidant Activity of Fresh and Fried Local Fruits Bioactivities of Wood Polyphenols Antioxidants and Biological Effects** The phenolic and polyphenolic compounds present in date palm, oak, quibracho, banana, and pine wood play a crucial role in the development of natural antioxidants. This study provides structural information on the phenolic compounds isolated from wood obtained from a series of old date palm (OPW), seedling date palm (SPW), oak (OW), quibracho (QW), banana (BW), and pine (PW) and their associated products. The total phenolic content (TPC), total flavonoid content (TFC), tannin content (TC) as well as the antioxidant activity of wood extracts was studied by employing in vitro assays using the free radical scavenger 1,1-diphenyl-2-picrylhydrazyl (DPPH) and iron chelatiom methods. The antioxidant activity and phenolic content of SPW extract, as determined by the DPPH assay, TPC and TC were higher than those of the other wood extracts. Analysis of wood extracts revealed a high amount of phenolics and tannins suggesting a possible role of wood phenolics as a source of natural antioxidants. These studies clearly indicate that the SPW had a significant antioxidant activity. In addition, the antioxidant capacity of soluble- and insoluble-bound phenolics of wood extracts was examined, as well as their bioactivities such as inhibition of oxidation of LDL cholesterol and DNA strands breakage. The results so obtained also confirmed the fact that antioxidant potential and oxidation inhibitory activities were much higher for the SPW compared to other wood extracts. Furthermore, in this study, the date palm wood was used to generate smoke that was subsequently used to prepare smoked salmon, using maple wood as a commercial standard. Prominent volatile compounds released during the smoking process were adsorbed using solid-phase microextraction (SPME) and were then identified by gas chromatography-mass spectrometry (GC-MS). The oxidative stability of the smoked salmon was evaluated in terms of development of thiobarbituric acid reactive substances (TBARS). Regardless of the wood type, volatile compounds were mainly methoxyphenols, with the highest contribution from eugenol, followed by guaiacol and their corresponding derivatives. The phenolic composition of OPW, SPW, OW, QW, BW, and PW were studied using conventional analytical methodologies. In addition, matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF/TOF-MS) and tandem mass spectrometry (MS/MS) analyses were used to examine the structures of various phenolics, tannins, and lignin compounds. The results showed that OPW, SPW, OW, QW were rich in the classes of compounds tested. Both condensed tannin and hydrolyzable tannins were present in high amounts in SPW, OPW, and OW and their phenolics present showed the highest antioxidant values compared to QW, BW, and PW. **Determination of Antioxidant Activity and Phenolic Content in Peppermint, Chamomile, Lemon Myrtle and Black Tea Phenolic Compounds in Food Characterization and Analysis CRC Press** 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. **Effect of Different Solvent Type on Total Phenolic Content and Antioxidant Activity of Agarwood Leaves Determination of Phenolic Content, Antioxidant Activity, and Antimicrobial Properties of 'zhourat Using Variable Extraction Conditions Comparison of Antioxidant Activity and Phenolic Content in White Tea with Black Tea, Green Tea and Oolong Tea 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** 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. **Sorghum Phenolic Extracts Their Storage Stability and Antioxidant Activity in Sunflower Oil** Whole grain and bran samples of two Malawian sorghums, Phatafuli, (a brown-coloured condensed tannin variety) and Shabalala, (a white-coloured condensed tannin-free variety) were analysed for their content of total phenols, condensed tannins and antioxidant activities. The effect of oxidizing conditions during extraction, and the storage stability of a freeze-dried crude phenolic extract (CPE) from the condensed tannin sorghum bran as influenced by packaging, storage temperature and length of storage, in relation to its content of total phenols, condensed tannins and antioxidant activity was also investigated. Antioxidant activity of the CPE, in comparison with tertiary butyl hydroquinone (TBHQ), was then evaluated in sunflower oil at concentrations of 1000, 1500 and 2000 ppm in the absence or presence of ferric ions at 2.2 and 4.4 ppm in the dark at 65oC. Progression of oxidation was monitored by measurement of peroxide values (PV) and anisidine values (AV) during a 14-day storage period. Phatafuli contained higher content of total phenols and antioxidant activity than Shabalala both in the whole grain and the bran, probably due to the presence of condensed tannins in Phatafuli sorghum, which were not detected in Shabalala sorghum. For both sorghum varieties, the bran contained higher levels of total phenols and antioxidant activity than the whole grain, confirming that phenolic compounds in sorghum are largely concentrated in the bran. Antioxidant activities of the sorghum varieties correlated highly with their total phenol and condensed tannin contents, suggesting that the phenolic compounds were largely responsible for the antioxidant activities of the sorghum grains. Bubbling of oxygen into the liquid crude phenolic extract did not have any significant effect on the parameters tested. Similarly, vacuum-packed samples did not differ significantly in the parameters tested from the samples that were not vacuum-packed. CPE samples stored at 20oC had significantly higher levels of total phenols, condensed tannins and antioxidant activity than those stored at 25oC during some days of storage. Storage time was however the major factor influencing the levels of total phenols, condensed tannins and antioxidant activity of the CPE from Phatafuli sorghum during storage, which suggested that CPE from condensed tannin sorghum bran might need to be used shortly after extraction to ensure optimum antioxidant activity. There was an insignificant correlation between the antioxidant activities of the CPE and their phenolic contents during storage, which could have been due to the formation of new compounds with a lower antioxidant capacity. The CPE inhibited oxidation of sunflower oil as shown by lower peroxide values and anisidine values compared to control samples. The CPE was however less effective in reducing peroxide values compared to TBHQ, but was similar to TBHQ in reducing anisidine values. In the presence of ferric ions, the CPE appeared to be less effective in reducing peroxide values compared to TBHQ, but appeared to be more effective than TBHQ in reducing anisidine values. The results showed that the tannin sorghum bran CPE appeared to act as both lipid radical scavengers and metal chelators. The CPE however imparted colour to the sunflower oil, which could limit its application as a natural antioxidant in edible oils. **Effect of Drying Methods and Extraction Solvent on the Total Phenolic Content and Antioxidant Activity of Pulp and Peel Extracts of Benincasa Hispida** Benincasa hispida (B. hispida) also known as kundur, a member of cucurbitacea (cucurbit) family that gain highly attention as their biological function such as antioxidant, antimutagenic activities and high in polyphenol content. The foods that we eat contain high chemical composition especially ready to eat food thus, it is important to know the basic nutrition content from the food. With increasing the variety of food production, the increasing in antioxidant activity needed in order to prevent serious health's problem. Natural antioxidant usually comes from plant and from variety part of plants, it also contains its antioxidant value and phenolic content. The objective of this study is to evaluate how drying process of peel and pulp of B. hispida also by using different solvent can affect the antioxidant activity and total phenolic content (TPC) of the peel and pulp extracts. The effects of different drying proces (microwave dried and oven dried) and different solvent systems (ethanol, methanol, ethanol-water 80:20 and methanol-water 80:20) were assessed on the antioxidant activity and total phenolic contents of B. hispida peel and pulp. Antioxidant activities of the sample were determined through DPPH radical scavenging activity, while the TPC was determined spectrophotometrically using Folin-Ciocalteae assay. There was a difference in the extracting ability of each of the solvents. The aqueous solvents were superior in their ability to extract the antioxidants and aqueous methanol was significantly more efficient than aqueous ethanol as shown by the TPC results. As for DPPH, oven-dried pulp samples extracted by methanol solvent showed the highest scavenging activity at 96.55%. The pulp samples showed the highest radical scavenging activity of 81.98% (microwave-dried) and 97.80% (oven-dried) when extracted using 100% ethanol. Meanwhile the peel samples demonstrated highest radical scavenging activities at 68.35% (microwave-dried) and 81.84% (oven-dried) when extracted by aqueous methanol. The findings of this study revealed that 80% methanol and 100% ethanol are the best two extraction solvents used for obtaining the highest antioxidant activities Also, the peel and pulp samples drying process prior to extraction, also influenced the extraction yield. Oven dried peel samples had the highest yield while oven dried pulp had the lowest. From the result it shows that oven-dried has the best drying method by using aqueous methanol for antioxidant activity. While, for total phenolic content aqueous methanol show the best extraction solvent with microwave-dried. The result obtained demonstrated the potential of the peel and pulp of B. hispida as an alternative source of antioxidant agents. **Phenolic Compounds: Functional Properties, Impact of Processing and Bioavailability** In this chapter, we discuss the influence of the processing methods on the content of phenolic compounds in fruits and vegetables. The intake of fruits and vegetables based-foods are associated with delayed aging and a decreased risk of chronic disease development. Fruits and vegetables can be consumed in natura, but the highest amounts are ingested after some processing methods, such as cooking procedures or sanitizing methods. These methods are directly methods are directly related to alteration on the phenolic content. In addition, the postharvest conditions may modify several phytochemical substances. Phenolic compounds are referred to as phytochemicals found in a large number of foods and beverages. The relative high diversity of these molecules produced by plants must be taken into account when methods of preparation are employed to obtain industrial or homemade products. Phenolic compounds comprise one (phenolic acids) or more (polyphenols) aromatic rings with attached hydroxyl groups in their structures. Their antioxidant capacities are related to these hydroxyl groups and phenolic rings. Despite the antioxidant activity, they have many other beneficial effects on human health. However, before attributing health benefits to these compounds, absorption, distribution, and metabolism of each phenolic compound in the body are important points

that should be considered. **Antioxidant Activity, Total Phenolic and Vitamin C Content of Five Species of Cultivated Mushrooms Antioxidant Activity, Total Phenolic and Flavonoid Content of Leave, Stem and Rhizome of Plagiostachys Spp. (Zingiberaceae)**