Effects of processing on phytochemical profiles and biological activities for production of sorghum tea

The present study was undertaken to assess the changes of phytochemical profiles, antioxidant, α-glucosidase and α-amylase inhibitory activities of sorghum grain during the processes of sorghum tea production. Significant (p<0.05) changes of total phenolics (TPC), total flavonoids (TFC) and procyanidins (PAC) contents were found in sorghum grains during soaking, steaming and roasting processing. Significant (p<0.05) increases of ferulic (free) and p-coumaric acid (bound) were present in sorghum upon steaming processing. Roasting processing (150°C, 1h) caused significant (p<0.05) increases in phenolic acids, TPC, TFC and PAC compared with the soaking and steaming stages. Accompanied with the changes of phytochemicals of sorghum grain, there were complex changes of biological activities during the successive processes. Our study also showed that there were positive linear correlations between TPC, TFC, PAC and bioactivities of sorghum grain, however, PAC has the strongest correlation (0.979, 0.968 and 0.912, respectively, p<0.0001) with DPPH radical-scavenging activity, α-glucosidase and α-amylase inhibitory activities [Li Wua, Zhaohui Huanga, Peiyou Qin and Guixing Ren*(Institute of Crop Science, Chinese Academy of Agricultural Sciences, Beijing, 100081, China), Food Research International, 2013, 53(2), 678-85].

Vegetables containing phytochemicals with potential anti-obesity properties: A review

The incidence of obesity is rising worldwide at an alarming rate and is becoming a major public health concern with incalculable social and economic costs. Studies have exposed the relationship between the adiposity, inflammation and the development of other metabolic disorders, so dietary factors that influence some or all of these are of interest. Dietary phytochemicals appear to be able to target different stages of the adipocyte (fat cell) lifecycle. For example, several classes of polyphenols have been implicated in suppressing the growth of adipose tissue through modifying the adipocyte lifecycle. Many dietary phytochemicals also have strong anti-inflammatory activity, but the amount present in plants varies and may be affected by processing. In this review we summarise the likely mechanisms of action of plant phytochemicals. We highlight the major vegetable sources of polyphenols, including those with possible synergistic attributes, discuss the variation in polyphenol levels and their distribution in cultivars and outline the effects of food processing. The identification and characterisation of the anti-obesogenic properties of phytochemicals in vegetables, as well as an appreciation of the effect of cooking on phytochemical content provide significant new information supporting dietary guidelines that encourage vegetable consumption for the prevention and management of lifestyle related disease [David J. Williams*, David Edwarsha, Ingrid Hamernig, Le Jian, Anthony P. James, Stuart K. Johnson and Linda C. Tapsell (Agri-Science Queensland, Department of Agriculture, Fisheries and Forestry (DAFF), PO Box 156, Archerfield BC, Queensland 4108, Australia), Food Research International, 2013, 52(1), 323–333].

Phytochemical composition of extracts from wheat grain fractions obtained by tangential abrasive dehulling

This study examined the phytochemical content and composition of extracts from wheat bran fractions obtained by abrasive dehulling.
Wheat grain was fractionated using a Tangential Abrasive Dehulling Device (TADD). The aqueous ethanol extracts of whole wheat, bran, TADD and commercial aleurone samples were analyzed for their total phenolic content (TPC), oxygen radical absorbance capacity (ORAC) and 2,2-diphenyl-1-picrylhydrazyl radical scavenging capacity (DPPH). The fractions with the highest antioxidant capacity were further analyzed for their tocopherol, phenolic acid, carotenoid and organic acid contents. The correlations between chemical composition and antioxidant properties of wheat extracts were developed. All TADD samples had higher tocopherol contents than the bran from a quadrumat senior mill. Lutein was the primary carotenoid in all the samples. Ferulic and caffeic acids were the strongest contributor to DPPH and TPC of the extracts, respectively. Correlation between ORAC and tocols content of the samples was positive and strong ($r = 0.75793$, $p < 0.0001$). This study demonstrated that TADD was more effective than quadrumat senior mill to obtain wheat bran fractions enriched in health beneficial phytochemicals. The correlations between chemical composition and antioxidant properties of TADD bran extracts developed in this study are helpful to formulate products with desired efficacy [Yongfen Chen, Nurhan Turgut Dunford* and Carla Goad (Department of Biosystems and Agricultural Engineering, Oklahoma State University, USA), LWT - Food Science and Technology, 2013, 54(2), 353–359].

NPARR 5(2), 2014-0161 An investigation on preliminary phytochemical and safety profiles of methanolic root extract of Curculigo orchioides

The present study was aimed to evaluate phytochemical constituents and the safety of methanolic extract of root parts of Curculigo orchioides (MECO) by determining their potential toxicity after acute and 28-day repeated dose administration in Wistar Albino rats. The phytochemical analysis was done by standard laboratory grade reagents. Acute and 28-day repeated dose oral toxicity studies were performed by the following OECD test guidelines 423 and 407, respectively. The present study reveals the presence of complex phytochemical constituents like flavonoids, saponins, glycosides, terpenoids, steroids and phenols. In acute toxicity study no treatment related death or toxic signs were observed with MECO administration. In repeated dose study no significant differences in body weight changes and hematology was observed between control and MECO groups. Conversely there was a decrease in serum glucose and cholesterol levels and an increase in protein levels in treated rats compared to control. No gross pathological findings and difference in relative organ weights were observed between control and treated rats. Histopathological examination revealed no abnormalities with the test drug treatment. In conclusion C. orchioides was found to be non toxic in tested doses and experimental conditions [Elumalai Anandakirunchane, Irisappan Sarath Chandiran* and Balamuthu Kadalmani (Gokula Krishna College of Pharmacy, Sullurpet 524121, Nellore, A.P., India), Journal of Pharmacy Research, 2013, 7(8), 692–696].

NPARR 5(2), 2014-0162 Phytochemicals and antioxidants in leaf extracts of Ginkgo biloba with reference to location, seasonal variation and solvent system

To determine the influence of location, seasonal variation and solvent system in production of phytochemicals and antioxidants from ginkgo leaves. Total phenolic and flavonoid contents and antioxidant activity in ginkgo leaf extracts were estimated spectrophotometrically. Factorial analysis was performed to correlate the influence of location, season and solvent on production of phytochemicals and antioxidants. Total phenolic and flavonoid contents as well as the antioxidants were estimated maximum in autumn. Among solvents, acetone/water extracts gave best results for phenolic and flavonoid contents while methanolic extracts were best for
antioxidants. Phenolic content, the predominant indicator of phytochemicals, showed significant correlation with antioxidant activity. Factorial analysis among location, season and solvent with respect to the phytochemicals and antioxidants, was found to be statistically significant. Presence of phytochemicals along with the protective feature in the form of antioxidants is indicative of the importance of this species in pharmacological industry [Priyanka Sati, Anita Pandey*, Sandeep Rawat and Anju Rani (Biotechnological Applications, G. B. Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, Almora 263 643, Uttarakhand, India), Journal of Pharmacy Research, 2013, 7(9), 804–809].

NPARR 5(2), 2014-0163 Study of total phenol, flavonoids contents and phytochemical screening of various leaves crude extracts of locally grown Thymus vulgaris

To prepare various crude extracts using different polarities of solvent and to quantitatively evaluate their total phenol, flavonoids contents and phytochemical screening of Thymus vulgaris collected from Al Jabal Al Akhdar, Nizwa, Sultanate of Oman. The leave sample was extracted with methanol and evaporated. Then it was defatted with water and extracted with different polarities organic solvents with increasing polarities. The prepare hexane, chloroform, ethyl acetate, butanol and methanol crude extracts were used for their evaluation of total phenol, flavonoids contents and phytochemical screening study. The established conventional methods were used for quantitative determination of total phenol, flavonoids contents and phytochemical screening. Phytochemical screening for various crude extracts were tested and shown positive result for flavonoids, saponins and steroids compounds. The result for total phenol content was the highest in butanol and the lowest in methanol crude extract whereas the total flavonoids contents was the highest in methanol and the lowest hexane crude extract. The crude extracts from locally grown Thymus vulgaris showed high concentration of flavonoids and it could be used as antibiotics for different curable and uncurable diseases [Mohammad Amzad Hossain*, Khulood Ahmed Salim AL-Raqmi, Zawan Hamood AL-Mijizy, Afaf Mohammed Weli and Qasim Al-Riyami (School of Pharmacy, College of Pharmacy and Nursing, University of Nizwa, P. O. Box 33, Postal Code 616, Nizwa, Sultanate of Oman), Asian Pacific Journal of Tropical Biomedicine, 2013, 3(9), 705-10].

NPARR 5(2), 2014-0164 Beneficial phytochemicals in potato — a review

Potato contains several phytochemicals such as phenolics, flavonoids, polyamines, and carotenoids, which are highly desirable in diet because of their beneficial effects on human health. The concentration and stability of these constituents are affected by several factors such as genotype, agronomic factors, postharvest storage, cooking and processing conditions. The advances in analytical techniques have made possible the identification and understanding the functions of phytochemicals, particularly their antioxidant properties. The potatoes are stored and processed into a variety of products before consumption. In the present review, phytochemicals present in potatoes, factors affecting their content, stability and health benefits are discussed. Processing the potatoes rich in phytochemicals can play an important role in promoting the health of a large segment of population in the countries where potatoes form a substantial part of daily diet [Rajarathnam Ezekiel, Narpinder Singh*, Shagun Sharma and Amritpal Kaur (Department of Food Science and Technology, Guru Nanak Dev University, Amritsar, India), Food Research International, 2013, 50(2), 487–496].