

CURRENT TOPICS IN NUTRACEUTICAL RESEARCH

Volume 9

Number 1/2

February-May 2011

- 1-12 **SYNTRA-5 DOWNREGULATES INFLAMMATORY SIGNALLING IN OBESE TYPE 2 DIABETES MURINE MODEL *IN VIVO***
Robert T. Streeper, Armando Diaz, David Campos, Joel Michalek, Christopher Loudon, Wieslaw Furmaga and Elzbieta Izbicka
- 13-24 **ANTIOXIDANT AND NEUROPROTECTIVE EFFECTS OF JP05, A POLYHERBAL MEDICINE, ON HYDROGEN PEROXIDE-INDUCED OXIDATIVE INJURY IN NEURO-2A NEUROBLASTOMA CELLS**
Ramalingam Mahesh, Hyo Won Jung, Young-Ho Kim and Yong-Ki Park
- 25-30 **COMPARATIVE EVALUATION OF ANTIBIOTIC AND ANTIBIOTIC MODIFYING ACTIVITY OF QUERCETIN AND ISOQUERCETIN *IN VITRO***
Helenicy N.H. Veras, Israel J.M. dos Santos, Antonio C.B. dos Santos, Cícera N. Fernandes, Edinardo F.F. Matias, Gerlânia de O. Leite, Heloísa H.F. de Souza, José G.M. da Costa and Henrique D.M. Coutinho
- 31-34 **SELECTIVE ANTIMICROBIAL ACTIVITY OF *PIPER SARMENTOSUM* (KADUK) AGAINST *PSEUDOMONAS AEROGINOSA***
Siti Hanisah Puzi, Othman Abd Samah and Abubakar Sule
- 35-40 **EFFECT OF WHEAT BRAN ON POSTPRANDIAL GLUCOSE RESPONSE IN SUBJECTS WITH IMPAIRED FASTING GLUCOSE**
A. Afaghi, B. Ranjbari Omid, M. Sarreshtehdari, L. Ghanei, M. Alipour, A. Azadmehr, M. Emam Jomeh and A. Safari-Varyani
- 41-46 **SNACKING FREQUENCY, MENTAL HEALTH, HEALTH BELIEFS AND PHYSICAL HEALTH**
Katherine Chaplin and Andrew P. Smith
- 47-52 **SNACKING HABIT, MENTAL HEALTH, AND COGNITIVE PERFORMANCE**
Andrew P. Smith
- 53-60 **DEFINITIONS AND PERCEPTIONS OF SNACKING**
Katherine Chaplin and Andrew P. Smith
- 61-66 **ISOLATION OF PHYTOESTROGEN FROM *MOMORDICA CHARANTIA* SEEDS (BITTER MELON)**
Sharanabasappa A Patil, Saraswati B Patil and ND Satyanarayan
- 67-70 **PREBIOTIC EFFECTIVENESS OF GALACTOOLIGOSACCHARIDES AND β -GLUCAN IN STIMULATION OF GROWTH OF *LACTOBACILLUS ACIDOPHILUS* NCDC 13 *IN VITRO***
Tulika Arora and R.K. Sharma

Current Topics in Nutraceutical Research 9 (1/2): 1-12

1-12 SYNTRA-5 DOWNREGULATES INFLAMMATORY SIGNALLING IN OBESE TYPE 2 DIABETES MURINE MODEL *IN VIVO*

Robert T. Streeper, Armando Diaz, David Campos, Joel Michalek, Christopher Loudon, Wieslaw Furmaga and Elzbieta Izbicka

ABSTRACT: *We compared anti-inflammatory activity of Syntra-5, an herbal dietary supplement, versus metformin, Actos (pioglitazone hydrochloride), and Byetta (exenatide) in obese diabetic BKS.Cg-m^{+/+}Lepr^{db}/BomTac female mice (8 per group, including controls) on normal diet (ND) or high fat diet (HFD) +/- drugs for 8 weeks. We measured plasma levels of 40 biomarkers [chemokines, cytokines, endocrine, growth factors and metabolites including glucose, insulin, advanced glycation end product (AGE), cholesterol and triglycerides]. Pyruvate kinase activity, citrate, ADP and ATP and hexokinase II levels were determined in muscle. Organ pathology was assessed microscopically. Mean values of biomarkers were compared between treatment groups. Biomarker means varied significantly by treatment group and diet. Syntra-5 decreased levels of eotaxin, MCP-1, MCP-3, M-CSF, and increased IL-4 (ND), and decreased G-CSF, GM-CSF, and TGFβ (HFD) relative to controls. Pyruvate kinase and AGE increased, while insulin decreased in Syntra-5-treated animals relative to untreated on ND. Treatment group contrasts on biomarkers (MCP-3, IL-17, AGE, and insulin) also varied with diet. Syntra-5 decreased progression of histopathological changes versus all groups. Syntra-5 demonstrated superior anti-inflammatory activity relative to the anti-diabetic drugs on a background of genetic obesity, supporting the contention that Syntra-5 may be effective for type 2 diabetes.*

Current Topics in Nutraceutical Research 9 (1/2): 13-24

13-24 ANTIOXIDANT AND NEUROPROTECTIVE EFFECTS OF JP05, A POLYHERBAL MEDICINE, ON HYDROGEN PEROXIDE-INDUCED OXIDATIVE INJURY IN NEURO-2A NEUROBLASTOMA CELLS

Ramalingam Mahesh, Hyo Won Jung, Young-Ho Kim and Yong-Ki Park

ABSTRACT: *Herbal medicines with antioxidant properties are believed to have potential therapeutic effect against oxidative stress in neurodegenerative diseases. In this study, we evaluated the antioxidant and neuroprotective effects of JP05, a polyherbal medicine, on H₂O₂-induced oxidative injury in Neuro-2a (N2a) cells. The cells were treated with or without JP05, and then stimulated with 500 μM H₂O₂. Cell viability was determined by MTT assay, and the releases of NO and LDH and intracellular ROS were measured. The levels of MDA and PCO, the activities of SOD, CAT and GPx, and contents of GSH and GSSG were assayed with respect to expressions of iNOS, nNOS, Bax and Bcl-2 via the NFκB and MAPK pathways. JP05 potently inhibited the O₂^{•-}, H₂O₂, OH[•], NO[•] and possessed metal chelating properties. JP05 improved cell survival, decreased the levels of NO, LDH and intracellular ROS, modulated antioxidants by suppressing the expression of iNOS, nNOS and Bax, and increased Bcl-2 expression by modulating the NF-κB and MAPK pathways. Our results indicate that JP05 protects neuronal cells against H₂O₂-induced oxidative injury by preventing cell apoptotic cascades and modulating NF-κB and MAPK pathways,*

suggesting that JP05 has therapeutic potential for the treatment of neurodegenerative diseases.

Current Topics in Nutraceutical Research 9 (1/2): 25-30

25-30 COMPARATIVE EVALUATION OF ANTIBIOTIC AND ANTIBIOTIC MODIFYING ACTIVITY OF QUERCETIN AND ISOQUERCETIN *IN VITRO*

Helenicy N.H. Veras, Israel J.M. dos Santos, Antonio C.B. dos Santos, Cícera N. Fernandes, Edinardo F.F. Matias, Gerlânia de O. Leite, Heloísa H.F. de Souza, José G.M. da Costa and Henrique D.M. Coutinho

ABSTRACT: *The use of secondary metabolites with biological properties, such as flavonoids, has been increasingly documented. This work evaluates the in vitro antibiotic activity of two flavonoids: quercetin and isoquercetin. The microdilution broth test was used to measure antimicrobial activity against standard and multiresistant strains of E. coli and S. aureus and strains of Candida. These flavonoids were also tested for a modulatory effect on aminoglycoside antibiotics. The flavonoids studied did not show significant antibacterial activity, while only isoquercetin demonstrated notable antifungal activity, inhibiting the growth of Candida krusei at a concentration of 32 µg/mL. In relation to modifying activity, there was no potentiation of the antibiotics tested. Isoquercetin showed antagonism with all the aminoglycosides examined, considerably increasing their minimal inhibitory concentrations (MICs). In light of these results, more in-depth studies are necessary, aimed at standardizing the protocols of antibiotic assays, as well as evaluating the effect of test substances against other classes of antimicrobials.*

Current Topics in Nutraceutical Research 9 (1/2): 31-34

31-34 SELECTIVE ANTIMICROBIAL ACTIVITY OF *PIPER SARMENTOSUM* (KADUK) AGAINST *PSEUDOMONAS AEROGINOSA*

Siti Hanisah Puzi, Othman Abd Samah and Abubakar Sule

ABSTRACT: Increasing awareness of hazards associated with the use of antibiotic and chemical agents has accelerated investigations into plants and their extracts as new sources of antimicrobial agents. Therefore, this study is aimed at determining the antimicrobial activity of Poly Butylene Succinate extracts of *Piper sarmentosum* leaves and stems against six pathogenic strains associated with humans namely; *Escherichia coli*, *Pseudomonas aeruginosa*, *Bacillus anthracis*, *Staphylococcus aureus*, *Candida albicans* and *Candida neoformans* by the disc diffusion method. The results revealed potent antimicrobial activity by both the leaves and stem extracts on *P. aeruginosa* at all the concentrations of the extracts used with an MIC values of 50mg/ml and 100 mg/ml obtained for with the stem and leaves extracts respectively by the micro broth method. The highest activity was exerted by the stem extract at 400mg/ml (20mm) and the least was by the leaves extract at 50mg/ml (9mm) on *P. aeruginosa*. However these extracts were unable to inhibit the growth of *E. coli*, *B. anthracis*, *S. aureus*, *C. albicans* and *C. neoformans* at all the tested concentrations. This confers utility of the extracts in treating infections associated with *P. aeruginosa* whereas they are unsuitable for infections associated with the other strains tested in this study.

35-40 EFFECT OF WHEAT BRAN ON POSTPRANDIAL GLUCOSE RESPONSE IN SUBJECTS WITH IMPAIRED FASTING GLUCOSE

A. Afaghi, B. Ranjbari Omid, M. Sarreshtehdari, L. Ghanei, M. Alipour, A. Azadmehr, M. Emam Jomeh and A. Safari-Varyani

ABSTRACT: *In addition to long term effect of wheat bran on improvement of insulin sensitivity, its effect on the postprandial blood glucose response, in clinical implementation is important. Therefore the aim of this study was to measure the reduced postprandial blood glucose of impaired fasting blood glucose subjects following consuming high glycemic load (GL) meal containing 25 g wheat bran. Nine subjects were given each of the following 2 meals in a randomized order one week apart: a high-GL meal (control), and the same high GL meal plus wheat bran (test meal). Using glucometer, finger prick blood samples for glucose analysis were used before the meals (fasting) and at 30, 60, 90, and 120 min following meal ingestion. At 90 and 120 min after the test meal ingestion, there was a 10.3% and 11% reduction in blood glucose concentration compared with control meal ($P = 0.02$, and 0.03 respectively). Also, there was positive correlation between 2 hrs postprandial blood glucose concentration of control and test meals ($r = 0.95$, $P < 0.001$ at 0.01 level). The repeated measures ANOVA, test of within-subjects effects, confirmed that the blood glucose profile over time differed between the 2 meal types ($P < 0.03$; $n = 9$, for the group by time interaction).*

41-46 SNACKING FREQUENCY, MENTAL HEALTH, HEALTH BELIEFS AND PHYSICAL HEALTH

Katherine Chaplin and Andrew P. Smith

ABSTRACT: *The aims of the current study were to examine associations between snacking frequency and mental health, health related behaviors, health beliefs and physical health. Snacking frequency per se was examined in addition to frequency of consumption of specific snack items. One hundred and thirty six participants (96 females, 40 males, mean age 37 years), including both students and members of the general public took part in the study. Participants completed a variety of psychosocial questionnaires and a snacking questionnaire. Participants who had a snack everyday reported significantly less depression than those who did not. Snacking frequency positively correlated with chocolate, crisp and biscuit consumption. Participants who consumed snacks like crisps and chocolate reported greater concerns about their current and future health status and also had less motivation to be healthy. No differences were found with respect to physical health. Participants who ate snacks such as chocolate and crisps ate a lot of fried foods and had more worries about their health. The participants who consumed snacks such as fruit and yoghurt had better diets and were optimistic about their future health. It is not possible to determine from the present results whether eating habit determines health concerns or whether health determines eating habits.*

47-52 SNACKING HABITS, MENTAL HEALTH, AND COGNITIVE PERFORMANCE

Andrew P. Smith

ABSTRACT: *There is now considerable evidence that eating habits are moving away from consumption of a few large meals a day to a pattern that involves more frequent consumption of smaller amounts of food (snacking). The main aim of the present study was to consider the relationship between snacking habits and mental health and cognitive performance. The above issues were examined in four samples: one from a general population sample (aged 20-60); one from a sample in their late teens living at home; another from a student sample (aged 18-30); and finally an elderly sample (aged 65 +). The results showed little evidence of significant differences as a function of snacking habit. The snacks consumed were typically crisps, sweets, biscuits, and cakes. The absence of an effect of these types of snacks contrasts with the positive effects associated with breakfast cereal. Cereal based snacks may, therefore, have greater benefits and further research is required to test this view and investigate other types of snack food.*

53-60 DEFINITIONS AND PERCEPTIONS OF SNACKING

Katherine Chaplin and Andrew P. Smith

ABSTRACT: *The purpose of this study was to investigate definitions of snacking, perceptions of snack foods and snacking behavior. One hundred and thirty six participants (96 females, 40 males, mean age 37 years), who were either students or members of the general public took part in the study. The participants completed a snacking questionnaire which measured their snacking behavior and beliefs. The majority of participants believed that snacking was best defined as food or drink eaten between main meals. The majority of participants consumed at least one snack per day (80%) and had on average 4.5 eating episodes per day. Participants were able to group snack foods depending on their differing qualities with sub-groups of the sample consuming snacks from these groups. This study supports previous evidence that snacks are best defined relative to meals however it highlights a need for further research to be done examining the relationship between meals and snacks. The findings identify that not all snack foods provide extra calories and therefore snacking is not necessarily a predisposition to obesity.*

61-66 ISOLATION OF PHYTOESTROGEN FROM *MOMORDICA CHARANTIA* SEEDS (BITTER MELON)

Sharanabasappa A Patil, Saraswati B Patil and ND Satyanarayan

ABSTRACT: *Momordica charantia* Linn. has traditionally been used to induce the menstruation and abortions in women of Amazon and Brazil. Phenolphthalein isolated from the crude ethanol extract of *M. charantia* seeds has been recently identified as

phytoestrogen. Its structure was elucidated using IR, ¹H NMR and Mass spectroscopic methods. Phenolphthalein molecule was reported for the first time from *M. charantia* seeds. *In vivo* studies were conducted using an ovariectomized rat model to determine the estrogenic activity of the isolated molecule. To determine the estrogenic effects, isolated phenolphthalein [50, 100 and 125mg/kg B. W.], authentic phenolphthalein sample [100mg/kg B. W.] and 17 β -estradiol [1 μ g/rat] administered orally to ovariectomized 25 days old immature rats for 5 days. Estrogenic potency was determined by analyzing uterine weight, uterine DNA concentration and vaginal cell cornification. Phenolphthalein produced a dose-dependent increase in uterine weight, increase in DNA concentration and differentiated vaginal cells in ovariectomized rat. Morphological changes were observed in uterus like increase in diameter of uterus, thickness of myometrium, endometrium and epithelial cell height. To our knowledge, this is the first evidence showing *in vivo* estrogenic activity of phenolic phytoestrogen from *M. charantia* seeds. This novel class of natural phytoestrogen has the potential to be developed for use as dietary supplement in the treatment of menopausal symptoms.

Current Topics in Nutraceutical Research 9 (1/2): 67-70

67-70 PREBIOTIC EFFECTIVENESS OF GALACTOOLIGOSACCHARIDES AND β -GLUCAN IN STIMULATION OF GROWTH OF *LACTOBACILLUS ACIDOPHILUS* NCDC 13 *IN VITRO*

Tulika Arora and R.K. Sharma

ABSTRACT: *Prebiotic effectiveness of galactooligosaccharides (GOS) and barley β -glucan preparation to stimulate the proliferation of a potential probiotic, Lactobacillus acidophilus NCDC 13 was studied in vitro by measurement of decline in pH, increase in OD₆₀₀ of medium and viable counts of the probiotic bacterium. Both preparations were evaluated in the concentration range of 1-5% (w/v) added to carbohydrate free basal medium. GOS supplementation at 2% (w/v) was found to be optimum for growth of probiotic up to 9 log cfu/ml in 12 h. Higher GOS supplementation did not result in improvement of viable counts. β -Glucan addition at a level of 3% (w/v) resulted in increase in viable counts by ~2 log cycle in 12 h. High viable counts (around 10 log cfu/ml) were obtained by adding β -glucan at concentrations of 4-5% (w/v), however, the medium turned highly viscous. Barley β -glucan seemed to be a slightly better substrate as compared to the GOS preparation for proliferation of Lactobacillus acidophilus NCDC 13. Both the prebiotic carbohydrates may act as suitable substrates in maintaining the sufficient number of viable counts of the probiotic in synbiotic preparation.*