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69-74 HONEY AND CANCER – A REVIEW

Natalia G. Vallianou, Angelos Evangelopoulos, Alexandros Skourtis, and Christos Kazazis

ABSTRACT: Honey mainly consists of sugars and water, but also contains several vitamins, especially B complex and vitamin C, together with a lot of minerals. Some of the vitamins found in honey include ascorbic acid, pantothenic acid, niacin and riboflavin. Minerals such as calcium, copper, iron, magnesium, manganese, phosphorus, potassium and zinc are also present in honey. Honey has been demonstrated to possess anti-cancerous characteristics, which may be utilized in cancer prevention and treatment. Its pro-apoptotic and anti-proliferative properties are attributed to its phenolic content, especially chrysin, which is implicated in the increased expression of caspase-9, caspase-3 and the pro-apoptotic protein Bax as well as the decreased expression of the anti-apoptotic protein Bcl-2. TNF- α has been suggested to be involved in honey-induced apoptosis through the induction of caspase-8, which is mainly triggered by its phenolic compound chrysin. TNF- α and IL-6 are implicated in the immune-protective and immune-modulatory properties of honey, while the estrogen antagonistic effect of honey contributes to its immune-modulatory activity, too. Unfortunately, most studies have been conducted in vitro and not in vivo, where the co-administration of other drugs may be a problem, especially among cancer patients, who usually take multiple agents that affect the CYP3A4 enzyme. The anti-cancerous properties of honey will be reviewed here.

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75-84 THE FATTY OIL FROM OKRA SEED: SUPERCRITICAL CARBON DIOXIDE EXTRACTION, COMPOSITION AND ANTIOXIDANT ACTIVITY

Zeng Dong, Jian-Guo Zhang, Ke-Wei Tian, Wen-Juan Pan, and Zhao-Jun Wei

ABSTRACT: Supercritical carbon dioxide extraction (SC-CO₂) of oil from okra (*Abelmoschus esculentus* L.) seed was performed and compared using screw press expression (SPE) and solvent extraction (SE) methods. Response surface methodology (RSM) was applied to optimize the parameters of SC-CO₂ extraction. The statistical analysis proved that the quadratics of pressure, the interactions between pressure and CO₂ flow rate, the linear term of pressure and extraction time, influenced the oil yield to a highly significant level. The optimal extraction condition for oil yield within the experimental range of the variables researched was at 299.08 bar, 14.88L/h, 40.73°C and 93.89 min. At this condition, the yield of oil was predicted to be 17.16%. The okra seed oils yields extracted by SC-CO₂, SE and SPE are 17.17%, 18.21% and 15.92%, respectively. There are no significant differences in the compositions of the oils extracted from these three methods. The four main components of all oils are linoleic acid, oleic acid, palmitic acid and stearic acid. The DPPH radical scavenging activity of the oil extracted by SPE is higher than those by SC-CO₂ and SE.

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85-90 EFFECT OF DAIDZEIN AND GENISTEIN ON SERUM GLUCOSE, LIPID PROFILE AND PAROXONASE ACTIVITY IN DIABETIC RATS

Mohammad Hassan Eftekhari, Niyaz Mohammadzadeh Honarvar, Abdolreza Rajaeifard and Aliakbar Owji

ABSTRACT: Evidence is emerging that soybean phytoestrogens play a beneficial role in diabetes. This study was conducted to evaluate the effect of daidzein and genistein as most important isoflavones in soybean on glucose, lipid profile and antioxidant enzyme activities in diabetic rats. Sixty male Sprague-Dawley rats were divided into six equal groups. Experiments were performed for 21 days. The rats of Group A as healthy control and group B as diabetic control were fed laboratory standard diet. The rats of Groups C, D and E were fed standard laboratory diet plus 600 mg/kg daidzein, 600 mg/kg genistein, and 600 mg/kg daidzein and genistein 50/50 respectively. Diabetes in groups B, C, D, and E was induced by a single injection of 60 mg/kg body weight streptozotocin (STZ). Blood biochemical parameters such as serum glucose, T-Cholesterol, triglyceride (TG), LDL, HDL and Paraxonase activity were measured. Daidzein and genistein showed a significant positive effects in ameliorating lipid profile in treatment groups. Administration of daidzein and genistein to the STZ-induced rats significantly increased paraxonase activity. Our results indicate that supplementation diabetic rats with isoflavones was accompanied by an improvement in some indices of diabetes mellitus.

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91-100 PREVENTIVE EFFECTS OF BORAGE OIL AND LING-ZHI-8 PROTEIN ON CARBON TETRACHLORIDE-INDUCED ACUTE HEPATIC TOXICITY IN RATS

Cheng-Yao Yang, Lu-Te Chuang, Wen-Cheng Huang, Chien-Wei Hou, Dz-Chi Chen, Kee-Ching G. Jeng and Ting-Yu Kao

ABSTRACT: Liver diseases are the leading causes of death in most Western and Asian countries. Using carbon tetrachloride (CCl₄)-stimulated rats as a model of acute hepatic inflammation, this study evaluated the hepatoprotective properties of two anti-inflammatory/immunomodulatory agents, borage oil (BO) and Ling-Zhi-8 (LZ-8), which is a small-molecular-weight protein extracted from *Ganoderma lucidum*. Ingested BO modified the fatty acid composition of hepatic phospholipids, in particular by increasing the arachidonic acid (AA) proportion by 9.2% relative to the CCl₄-stimulated control; however, no such modulatory effect was found in rats fed LZ-8 alone. Histologic and biochemical analyses confirmed that CCl₄ treatment alone caused mild to moderate acute inflammation. Oral administration of BO or LZ-8 prior to CCl₄ treatment markedly reduced hepatic injury as evidenced by a lowering of the serum levels of aspartate aminotransferase (AST) (52.0%), alanine aminotransferase (ALT) (34.9%), prostaglandin E₂ (PGE₂) (67.2%) and type-2 cyclooxygenase (COX-2) (39.9%). Furthermore, BO and LZ-8 in combination provided a greater hepatoprotective effect. In conclusion, this study shows that BO and LZ-8 protect against CCl₄-induced inflammation in a CCl₄ rat model by reducing the production of pro-inflammatory mediators.

Current Topics in Nutraceutical Research 12 (3): 101-106

- 101-106** **EFFECTS OF ROYAL JELLY SUPPLEMENTATION ON LIPID PROFILE AND HIGH-SENSITIVITY C-REACTIVE PROTEIN LEVELS IN TYPE-2 DIABETIC WOMEN: A PILOT STUDY**
Majid Mobasseri, Samira Pourmoradian, Reza Mahdavi and Elnaz Faramarzi

ABSTRACT: The aims of this study were to determine the effect of royal jelly supplementation as a complementary therapy on lipid profile and hs-CRP levels in type 2 diabetic females. In this pilot randomized clinical trial, fifty female volunteers with type2 diabetes were assigned into the supplemented (n=25) and placebo (n=25) groups, given a daily dose of 1000 mg royal jelly soft gel or placebo, for 8 weeks. At the onset and the end of the study, serum lipid profile and hs-CRP levels were determined. Paired and independent t-tests were used for data analyzing. Royal jelly supplementation significantly decreased the mean serum triglyceride (129.95 ± 32.02 vs. 108.95 ± 28.64 mg/dl; $P=0.01$) and total cholesterol levels (203.35 ± 14.39 vs. 191.20 ± 32.15 mg/dl; $P=0.004$) while in the placebo group the reduction levels were not statistically significant. The Mean HDL-c concentration was increased insignificantly in both groups. The mean hs-CRP level was reduced in the supplemented group whereas it was elevated in the placebo group; however, these changes were not statistically significant. In general, royal jelly supplementation improves fasting triglyceride, total cholesterol and hs-CRP levels in patients with type2 diabetes. However, further studies with larger sample size are needed to achieve more precise results.

Current Topics in Nutraceutical Research 12 (3): 107-114

- 107-114** **EFFECTS OF CHLORELLA PYRENOIDOSA ON CUTANEOUS ARTERIAL SYMPATHETIC NERVE ACTIVITY, CUTANEOUS BLOOD FLOW AND TRANSEPIDERMAL WATER LOSS IN RATS**
Yuko Horii, Tohru Mizoguchi , Yoshiyuki Fujisaki, Risa Fuyuki and Katsuya Nagai

ABSTRACT: Chlorella pyrenoidosa (*C. pyrenoidosa*) has higher content of chlorophyll than any known other plants, and also has vitamins, minerals, dietary fiber and other substances. To identify the effect of *C. pyrenoidosa* on skin condition, we measured cutaneous arterial sympathetic nerve activity (CASNA), cutaneous blood flow and transepidermal water loss (TEWL) in rats in three separate trials. We further attempted to determine if *C. pyrenoidosa* was targeting the histamine H3 receptors by pretreating a separate group with thioperamide, a histamine H3 antagonist, and then observing the CASNA and cutaneous blood flow response to *C. pyrenoidosa* in a fourth trial. Intraduodenal administration of *C. pyrenoidosa* caused marked inhibition of CASNA as well as significant elevation of cutaneous blood flow in rats. TEWL, furthermore, significantly decreased on the dorsal skin of conscious hairless rats when their only source of fluids was *C. pyrenoidosa* suspended in water. However, when animals were pretreated with thioperamide, *C. pyrenoidosa* eliminated the response of CASNA and cutaneous blood flow. These findings suggest that *C. pyrenoidosa* reduces CASNA, increases cutaneous blood flow, and enhances the water-retaining ability of the skin, and that histamine H3 receptors may be involved in the CASNA and cutaneous blood flow response.

115-122 EFFECTS OF DIETARY MUTTON ON IMMUNE RESPONSE IN RATS

Jia Chen, Feng Gao and Guang Hong Zhou

ABSTRACT: Thirty 4-week-old male Sprague-Dawley rats were allotted into two groups, which were subjected to the following treatments for a period of four weeks: feeding with the basal rat diet containing 20% protein Control-fed group, supplementation of the basal diet with 20% mutton powder to the basal diet at a final concentration of 20% protein mutton-fed group. After four weeks, the rats were killed and body weights (BW), food intake and organ weight were measured, serum concentrations of IL-2, IL-6, IL-10, IFN- γ , TNF- α , IgA, IgM and C3 and C4 levels in serum and T cell subsets in blood sample were examined. The results indicated that BW of mutton-fed rats was significantly increased compared to the control group; meanwhile, IL-6, IL-10, TNF- α concentrations and C3 levels in serum were significantly decreased ($P < 0.05$), the percentages of CD3 $^+$, CD4 $^+$ and CD8 $^+$ T cells were extremely significantly decreased ($P < 0.01$), but the IgM level was significantly higher ($P < 0.05$) for mutton-fed group. Conclusion: mutton consumption may decrease the anti-inflammatory capability of body, inhibit the activity of T cells and differentiation of T subsets and decrease cytokines production. This infers that, in rats, mutton consumption inhibits T cell immunity but promotes B cell immunity.