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Current Topics in Nutraceutical Research 6 (2): 61-66

61-66 A model system to screen for anti-oxidants in vegetables
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ABSTRACT: Micronutrients in the diet function as coenzymes or anti-oxidants and are essential for health. Several vegetables such as onion and garlic are supposed to have anti-oxidant properties. A simple chemical or biological method of screening them for their anti-oxidants will be valuable. A model system, the reaction between dimethyl sulfate and guanosine monophosphate to form N -7 methyl guanosine monophosphate and its inhibition by added water-soluble vegetable extracts as a criterion of the additive's anti-oxidant potential has been characterized. Dimethyl sulfate alkylates DNA and introduces double strand breaks that activates poly (ADP-ribose) polymerase and DNA ligase in 30 minutes following exposure of cultured human cells.. The kinetics of the reaction was studied by measuring the concentration of N- 7 methyl guanosine monophosphate with time by analyzing aliquots of the reaction

mixture by HPLC. The results show that the hydrophobicity of the medium contributes significantly to the reactivity of dimethyl sulfate with guanosine monophosphate. Sulfahydryls showed higher reactivity toward dimethyl sulfate, suggesting that these reagents are better anti-oxidants. Similar results were obtained using onion and garlic extracts. Overall, this study demonstrates that the dimethyl sulfate - guanosine monophosphate reaction system is a reliable screening method for anti-oxidants in common vegetables.

Current Topics in Nutraceutical Research 6 (2): 67-82

67-82 Anti-cancer diet: reviewing the role of nutrition in cancer prevention

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ABSTRACT: Nutritional factors have been found to account for about 30 percent of cancers in western countries. The contribution of diet to cancer risk in developing countries has been considered to be lower, around 20 percent, when poor diet is included the incidences are much higher. 30 to 40 percent cancers can be prevented by appropriate diets, physical activities, and maintenance of appropriate body weight. The link between diet, nutrition and cancer is now fully appreciated and a new paradigm for diet, nutrition and cancer prevention can be developed as we have good epidemiological evidences that some foods prevent and cause cancer. New concepts for diet and cancer prevention include the nutritional modulation of the carcinogenesis pathway by nutrients, micronutrients and phytochemicals. Factors like over consumption of energy, obesity, alcohol drinking, high fat, low fibre diet, less vegetables and fruits, preserved food, tobacco, exposure to aflatoxin, less physical activity are linked to increased risk of one or another type of cancer. Dietary factors like more fibre, more fruits and vegetables in diet, along with micronutrients, phytochemicals and probiotics have been proved to have anti-caner effect. Unravelling the effects of diet on cancer risk is, therefore, of great public health importance.

Current Topics in Nutraceutical Research 6 (2): 83-98

83-98 Cartilage derived peptacans: novel nutraceuticals with Immunomodulatory, anti-inflammatory and anti-arthritic activities

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ABSTRACT: A prominent pathological feature of osteoarthritis (OA) and rheumatoid arthritis (RA) is degradation of articular cartilage and the release of molecular fragments of the extracellular matrix into synovial fluid. These entities are antigenic and can stimulate an autoimmune response and synovitis. Oral tolerization of arthritic animals or RA patients with type II collagen (Col-II), the most abundant protein of cartilage, has been shown to attenuate disease activity but similar studies on other cartilage-derived antigens has not been previously described. In this review we report our animal and human clinical studies with the divalent salts (Ca, Mg, Zn) of Peptacan that are novel glycosaminoglycan (GAG)-polypeptide complexes isolated from bovine hyaline cartilage. The divalent metal Peptacan derivatives were evaluated for their oral dose dependent (10-300mg/kg) anti-inflammatory and antiarthritic activities in the rat collagen induced (CIA) and adjuvant induced (AIA) arthritis models using tolerogenic and prophylactic/therapeutic protocols. The topical anti-inflammatory property of Peptacan was also investigated under double blinded controlled conditions in human subjects using a standard skin erythema assay. Ca, Mg and Zn Peptacans were orally active at 15 mg/kg in suppressing the onset and severity of

arthritis in the rat CIA model using the tolerogenic protocol. In the rat CIA model calcium Peptacan (CaP) at 20 mg/kg was active using tolerogenic or prophylactic protocols. Histologically, joints from CaP treated animals showed a reduction of white cell infiltration and extent of cartilage/bone destruction. Similar findings were observed using a rabbit arthropathy model. The topical antiinflammatory of a Peptacan cream formulation was demonstrated using human subjects confirming the pharmacological activity of these nutraceuticals in the human species.

Current Topics in Nutraceutical Research 6 (2): 99-104

99-104 Protective effect of aqueous extract of date fruit against *in vitro* H_2O_2-induced cell damages

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ABSTRACT: Fruits of the date palm (Phoenix dactylifera L. Arecaceae) are consumed in many regions of the world. This fruit has been traditionally used as oriental folk medicine for mothers after childbirth and invalids. In the present study, the protective effect of aqueous extract of date fruit (AE-DF) against hydrogen peroxide H_2O_2- induced cytotoxicity in HEPG-2, A172, U937 and PC12 cell lines was investigated. Cytotoxic effects were evaluated by XTT assay. The total antioxidant capacity of AE-DF was measured using the Randox kit. In addition, the protective effects of AE-DF against H_2O_2– induced apoptosis was investigated using DAPI staining. The total antioxidant capacity of AE-DF was 1.97±0.04 mmol Trolox equivalent/l. The results demonstrated that AE-DF inhibits H_2O_2- induced cell damage in a concentration dependent manner. The 0.1% AE-DF significantly inhibited the 1.47mM H_2O_2- induced damage, especially in the A172 cells ($p<0.05$ to 0.001). Moreover, 10% AE-DF completely inhibited 29.4mM H_2O_2- induced damage. At the same time, the growth of U937 cells significantly increased in the presence of 10% AE-DF compared to the control cells ($p<0.01$). Cells treated with 2.94 mM H_2O_2 exhibited several apoptotic features, while those simultaneously exposed with H_2O_2 and AE-DF showed the complete inhibition of apoptotic features. These results suggest that date fruit may exert protective and proliferative effects against HO^- induced cytotoxicity.

Current Topics in Nutraceutical Research 6 (2): 105-108

105-108 Bonito extract as a natural and excellent source of free vitamin B_{12}

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ABSTRACT: Vitamin B_{12} of commercially available fish soup stocks and extracts were assayed and characterized. Although Vitamin B_{12} contents of the powdered and granuled types of soup stocks were very low (~0.8 μg/L), some of the liquid type of soup stocks contained considerably amounts of B 12 (>5.0 μg/L). Vitamin B_{12} content in the bonito extract that was made with raw bonito muscles was the highest (40.9+55555.5 μg/100 g) among the fish extracts tested. Silica gel 60 TLC-bioautogram analysis demonstrated that the selected fish extracts (bonito, salmon, and tuna) contain considerably high amounts of true vitamin B_{12}. Gel filtration experiments indicated that most of vitamin B_{12} found in the selected fish extracts (except for tuna) was recovered in the free vitamin B_{12} fractions. These results indicate that the fish extracts and their soup stocks would be natural sources of free Vitamin B_{12} for elderly persons with food-bound vitamin B_{12} malabsorption