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Phenolic Compounds and Antioxidant Activities of Krabok Extract

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Nuts are excellent sources of phytochemicals, especially antioxidants, which play an important role in human nutrition. Krabok is a type of nuts that is currently found in the northern and northeastern part of Thailand. Thus, limit information of phenolics and antioxidant activities of Krabok is available. The purpose of this study is to determine and compare the antioxidant activities and total phenolic compounds (TPCs) of Krabok from different cultivated areas in Thailand (Chiang Rai, Si Sa Ket and Ubon Ratchathani provinces). Krabok was prepared by roasting for 20 minutes and dehulled to get edible portions. A determination of TPCs was performed using Folin Ciocalteu assay, while antioxidant capacities were detected using ferric reducing/antioxidant power (FRAP) assay and oxygen radical absorbance capacity (ORAC) assay. As results, the highest values of FRAP and ORAC antioxidant activities as well as TPCs were found in raw Krabok from Ubon Ratchathani (11.98 0.90 micromol TE/100g), followed by those from Si Sa Ket (3,277.18 38.18 micromol TE/100g) and Ubon Ratchathani (74.22 1.01 mg GAE/100g), respectively. Interestingly, the FRAP antioxidant activity and TPCs were significantly increased in roasted Krabok; however, ORAC antioxidant activity was significantly decreased. The change of antioxidant activities and TPCs might be due to the effect of heat treatment, which may alter the structures of some molecules and destroy food matrix. Besides, some phenolics in Krabok might be the main bioactive compounds responsible for antioxidant activity. The results from this study would be useful to promote Krabok consumption as an alternative nut and product development from Krabok.

keywords: Antioxidants, Phenolic Compounds, Krabok, Nuts

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Finding the active components in Hsian-tsao tea with function of lowering blood triglyceride

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Hsian-tsao *Mesona procumbens* Hemsl.) is a popular herb in the Orient. The objective of this study was to investigate the function, mechanism of action, and active components of Hsian-tsao tea (HT) on hepatic lipid transportation and metabolism. In an animal study, the hypolipidemic function of lyophilized HT was confirmed in atherogenic hamsters. In HepG2 cells, HT reduced triglyceride (TAG) and apoB concentrations in the medium, without causing lipid accumulation in hepatocytes. The HT-mediated reduction in TAG output was associated with $MAPK^{erk}$ and $MAPK^{jnk}$ activation. In addition, HT activated 5' AMP-activated protein kinase (AMPK) and inhibited lipogenic activity, which may have contributed to liver lipid homeostasis. For finding the active components, HT was fractionated and three compounds, caffeic acid, kaempferol-3-*O*-beta-D-glucopyranoside, and (*S*)-rosmarinic acid were identified in fractions with the greatest hypolipidemic activity in HepG2 cells. When pure compound of caffeic acid, kaempferol-3-*O*-beta-D-glucopyranoside, kaempferol and rosmarinic acid was tested on HepG2 cells individually, only kaempferol reduced medium TAG concentration dose dependently. We concluded kaempferol-3-*O*-beta-D-glucopyranoside, which produced kaempferol after digestion, serve as a major active component responsible for HT-mediated triglyceride lowering effect.

keywords: Hsian-tsao tea, hypolipidemia, kaempferol

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Effects of oral administration of an olive fruit extract in subjects with mild knee joint pain

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Objective: The Mediterranean diet has many beneficial effects on preventing inflammation-associated diseases, and many of these effects have been attributed to the olive fruit and its oil. Our previous studies have demonstrated the anti-inflammatory effects of maslinic acid (MA) from olives in an arthritis mouse model. The present study investigated the effects of an orally administered MA supplement on subjects with mild knee joint pain.

Materials & Methods: This study was a randomized, double-blind, and placebo-controlled trial, and 20 subjects were included. The subjects received either 50 mg (n = 12) of MA or placebo (n = 8) daily for 3 months. Each subject was evaluated for pain and physical functions as the primary outcome measures using visual analog scale (VAS) scores and a standardized quality of life questionnaire (Short Form or SF-8). Secondary outcome measures included cartilage biomarkers and an inflammatory biomarker (hsCRP).

Results & Findings: Twenty subjects completed the study. Although both the MA and placebo groups exhibited improved pain scores on the VAS and quality of life on the SF-8 from before to after supplementation, the MA group exhibited slightly improved symptoms compared to the placebo group. The MA and placebo groups exhibited a 15% reduction and 13% increase, respectively, in hsCRP levels after supplementation. Furthermore, the MA group and not the placebo group exhibited significantly decreased body weight and body mass index in the subjects with mild joint pain at week 12 compared to the baseline level.

Conclusion: Olive fruit extract containing MA may improve joint health by controlling inflammatory responses and by promoting weight loss in subjects with mild knee joint pain.

keywords: olive, maslinic acid, joint pain

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Peanut skin extract reduces blood sugar due to inhibition of *alpha*-glucosidase

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Objectives We reported the peanut skin extract (PSE) containing diet (650 mg/kg) showed anti-obesity effect last year. In order to inquire the mechanism, we investigated its effect on *alpha*-glucosidase activity *in vitro*, and performed sugar tolerance test *in vivo*.

Materials & Methods In order to assess the effect of PSE on *alpha*-glucosidase activity, we prepared *alpha*-glucosidase solution using rat intestinal acetone powder (Sigma-Aldrich). PSE solutions were prepared at the concentration with 0, 1.0, 2.5, 5.0, 7.5, 10.0 and 15.0 mg/mL. Also, substrate (sucrose or maltose) solution was prepared at the concentration of 250 mM. 0.5 mL of each PSE solution was added to 2.0 mL of sucrose or maltose solution, and then 0.1 mL of *alpha*-glucosidase solution were added. Free glucose level was measured after 40 minutes incubation at 37 degrees centigrade, and then inhibition rate of *alpha*-glucosidase of each sample was calculated by conventional method.

Wistar strain male rats aged 7 weeks were used for sugar tolerance test. 2.0 g/kg of sucrose or maltose was orally given with/without 0.5g/kg of PSE (n=6 each, totally n=24) under 12 hours fasting. Blood glucose was measured at 15, 30, 60, 90, and 120 minutes after administration.

Results Sucrase activity and maltase activity were inhibited by added PSE *in vitro*. Half maximal (50%) inhibitory concentrations (IC_{50}) of sucrase and maltase activity by PSE were 3.6 mg/mL and 9.4 mg/mL respectively. Blood glucose level after 15 and 30 min in the group of "PSE + sucrose" were significantly lower than "sucrose" group. Area under the curve (AUC) in "PSE + sucrose" group was significantly smaller than "sucrose" group. Similar results were obtained in "PSE + maltose" group.

Conclusion Obtained results suggest that PSE possesses preventive action of diabetes due to its inhibitory effect of *alpha*-glucosidase.

keywords: peanut skin extract, blood sugar, *α*-glucosidase