

THERAPEUTICS

NPARR 2(2), 2011-228, **Anti-obesity effects of highly polymeric proanthocyanidins from seed shells of Japanese horse chestnut (*Aesculus turbinata* Blume)**

Recently, we have shown that seed shells contain a large amount of highly polymeric proanthocyanidins having a series of heteropolyflavan-3-ols with doubly linked A-type linkages as well as single B-type bonds without gallic acid esterified to them. Here, we attempted to evaluate *in vivo* anti-obesity effects of the polymerized proanthocyanidins in mice. An oral starch or glucose tolerance test in mice revealed that the isolated two fractions of highly polymerized proanthocyanidins with the different degree of polymerization suppressed effectively the elevation of blood glucose from oral starch, but not from oral glucose, suggesting the preferential inhibition of the digestive enzymes of carbohydrates. Moreover, *in vivo* anti-obesity effects of the total fraction containing the proanthocyanidins as a drink were investigated in mice fed a high-fat diet. Their anti-obesity effects became more evident after 9 weeks as determined by the attenuation of the elevation in body weight, the mass of peritoneal adipose tissues, and the plasma levels of total cholesterol and leptin. Furthermore, the increased size of hepatocytes and the generation of steatosis with micro- and macrovesicles in liver were normalized by the dietary supplementation of the total proanthocyanidin fraction.

The findings suggest the usefulness of highly polymeric proanthocyanidins from seed shells in the application to food as a dietary supplement with anti-obesity effects *in vivo* through the inhibition of digestive enzymes of carbohydrates and fats [Hideto Kimura, Satoshi Ogawa, Akihiko Sugiyama, Mitsuo Jisaka, Takashi Takeuchi and Kazushige Yokota* (The United Graduate School of Agricultural Sciences, Tottori University, 4-101 Koyama, Tottori-shi, Tottori 680-8553, Japan), *Food Research International*, 2011, 44(1), 121-126].

NPARR 2(2), 2011-229, **The chloroform fraction of guava (*Psidium cattleianum* Sabine) leaf extract**

inhibits human gastric cancer cell proliferation via induction of apoptosis

The antiproliferative activities of the chloroform fraction (CF) of guava (*Psidium cattleianum* Sabine) leaf extract were evaluated using several cancer cell lines. Maximum cytotoxicity was observed in SNU-16, a human gastric carcinoma cell line, at concentrations of 50–100 µg/ml. Flow cytometric analysis demonstrated that CF treatment resulted in a marked accumulation of SNU-16 cells in the sub-G1 phase at concentrations of 100–200 µg/ml. The induction of apoptosis in SNU-16 cells was confirmed by immunoblotting using antibodies against Bcl-2, Bax, poly (ADP-ribose) polymerase (PARP), caspase-8, and caspase-3. The major CF phytochemicals were identified as ferulic acid, genistein, 3', 4', 5' trimethoxy flavone, phlorizin, and oleanolic acid by high performance liquid chromatography coupled with a photo diode array and electrospray ionisation mass spectrometry (HPLC-PDA-ESI-MS). The results suggest that phytochemicals in the CF of guava (*P. cattleianum*) leaf extract induce apoptosis in SNU-16 cells. These findings may lead to new strategies for treating human gastric cancer [Jeong Yong Moon, Ashik Mosaddik, Hana Kim, Moonjae Cho, Hyung-Kyoon Choi, Young Suk Kim and Somi Kim Cho* (Subtropical Horticulture Research Institute, Jeju National University, Jeju 690-756, Republic of Korea), *Food Chemistry*, 2011, 125(2), 369-375].

NPARR 2(2), 2011-230, **Protective effect of bamboo shoot oil on experimental nonbacterial prostatitis in rats**

This study aim to investigate the protective effects of bamboo shoot oil (BSO) and its mechanisms on nonbacterial prostatitis (NBP). The anti-prostatitis effect of BSO were evaluated by prostate weight, acid phosphatase, density of lecithin corpuscles (DLCC), white blood cell count (WBC), and prostatic histomorphological parameters using Xiaozhiling-induced experimental NBP model in rats. The mechanisms of anti-prostatitis effect were assessed using functionally focused cDNA microarray and real-time PCR. BSO could significantly inhibited absolute prostate weight, prostate index, total acid phosphatase, prostatic acid phosphatase, WBC and the expression levels of thirty up-regulated genes,

while BSO could significantly increased DLCC and the expression levels of fifteen down-regulated genes. Histologically, BSO treatment significantly suppressed the severity of the lesion in NBP-induced rats. Thus, BSO may be useful for treatment of NBP, as it may inhibits prostate inflammation in NBP patients by affecting the expression of inflammatory cytokines, their receptors, and related genes [Baiyi Lu, Huafang Cai, Weisu Huang, Xiaoqin Wu, Yanxi Luo, Lianliang Liu and Ying Zhang* (The Department of Food Science and Nutrition, School of Biosystems Engineering and Food Science, Zhejiang University, Hangzhou 310029, PR China), *Food Chemistry*, 2011, 124(3), 1017-1023].

NPARR 2(2), 2011-231, Analgesic and anti-nociceptive activity of hydroethanolic extract of *Drymaria cordata* Willd.

To study the analgesic and anti-nociceptive activity of hydroethanolic extract of *Drymaria cordata* Willd. Wistar rats and Swiss albino mice were used for studying analgesic and anti-nociceptive activity of *Drymaria cordata* hydroethanolic extract (DCHE) at doses 50, 100 and 200 mg/kg p.o. Various models viz. acetic acid induced writhing model (female mice), Eddy's hot plate (mice) and tail flick model (rat) for analgesic study and formalin-induced paw licking model (mice) were used for anti-nociceptive study. In acetic acid induced writhing model, effect of DCHE was better than the standard drug- indomethacin 10 mg/kg (p.o.). In the hot plate model, the maximum effect was observed at 60 min at a dose of 200 mg/kg p.o., which was higher than the standard drug morphine sulfate (1.5 mg/kg i.p.), whereas in the tail flick model, effect was comparable with morphine sulfate. In formalin-induced paw licking model, administration of DCHE completely abolished the early phase at 100 and 200 mg/kg p.o. and in the late phase, the effect of DCHE (200 mg/kg p.o.) was higher than indomethacin (10 mg/kg p.o.). DCHE was effective in both non-narcotic and narcotic models of nociception, suggesting its possible action via peripheral and central mechanism. It also abolished the early phase in formalin-induced paw licking model, suggesting complete inactivation of C-fiber at higher dose. The activity can be attributed to the phyto-constituents viz tannins, diterpenes, triterpenes and steroids present in the DCHE extract. In conclusion, DCHE can be developed as a potent

analgesic and anti-nociceptive agent in future [Chandana Choudhury Barua*, Jayanti Datta Roy, Bhaben Buragohain, Acheenta Gohain Barua., Prabodh Borah and Mangala Lahkar (Department of Pharmacology and Toxicology, College of Veterinary Science, Assam Agricultural University, Khanapara, Assam India), *Indian Journal of Pharmacology*, 2011, 43(2), 121-125].

NPARR 2(2), 2011-232, Antileukemic activity of the leaf extract of *Bischofia javanica* blume on human leukemic cell lines

Leaves of *Bischofia javanica* (BJ) have been traditionally used for many ailments including cancer. In the present study, antileukemic activity of the leaf extract was evaluated on human leukemic cell lines. Human leukemic cell lines U937, K562, and HL60 were purchased from National Facility for Animal Tissue and Cell Culture, Pune, India. The cells were routinely maintained in RPMI 1640 medium supplemented with 10% heat inactivated fetal calf serum. Cultures were maintained at 37°C in a humidified atmosphere containing 5% CO₂ in air. The methanol extract of BJ (MEBJ) was dissolved in PBS and used at the concentrations of 5, 10, and 15 µg/ml for cell viability and cytotoxicity studies (MTT assay). Cell counts were made in quadruplicate samples at the interval of 24, 48, and 72 h and cytarabine (20 µg/ml) served as standard drug. The apoptotic pathway of cytotoxicity was assessed by DNA agarose gel electrophoresis technique and confirmed by fluorescence and confocal microscopic methods at the concentration of 10 µg/ml. MEBJ showed significant cytotoxicity (P<0.001) in leukemic cell lines in the in-vitro cell proliferation assay. IC₅₀ of MEBJ was very low (3.5 µg/ml) at 72 h in the HL60 cell line. The apoptotic pathway of cytotoxicity was observed at 10 µg/ml of MEBJ by the fragmented DNA pattern in the apoptosis assay, chromatin condensation, and apoptotic body formation as revealed in the fluorescence and confocal microscopic studies. The present findings support the ethno-medicinal use of BJ for cancer by mediating through the apoptosis pathway [Sutharson Lingadurai*, Soma Roy, Rajan Vedasiromoni Joseph and Lila Kant Nath(Department of Pharmacology, Himalayan Pharmacy Institute, Majhitar, Sikkim - 737 136 India), *Indian Journal of Pharmacology*, 2011, 43(2), 143-149].

NPARR 2(2), 2011-233, Effect of *Argyrea speciosa* root extract on cafeteria diet-induced obesity in rats

To evaluate the antiobesity effects of the ethanolic extract of *Argyrea speciosa* roots in rats fed with a cafeteria diet (CD). Obesity was induced in albino rats by feeding them a CD daily for 42 days, in addition to a normal diet. Body weight and food intake was measured initially and then every week thereafter. On day 42, the serum biochemical parameters were estimated and the animals were sacrificed with an overdose of ether. The, liver and parametrial adipose tissues were removed and weighed immediately. The liver triglyceride content was estimated. The influence of the extract on the pancreatic lipase activity was also determined by measuring the rate of release of oleic acid from triolein. The body weight at two-to-six weeks and the final parametrial adipose tissue weights were significantly lowered ($P < 0.01$ and $P < 0.05$, respectively) in rats fed with the CD with *Argyrea speciosa* extract 500 mg/kg/day as compared to the CD alone. The extract also significantly reduced ($P < 0.01$) the serum contents of leptin, total cholesterol, low density lipoprotein (LDL), and triglycerides, which were elevated in rats fed with CD alone. In addition, the extract inhibited the induction of fatty liver with the accumulation of hepatic triglycerides. The extract also showed inhibition of pancreatic lipase activity by using triolein as a substrate. The ethanolic extract of *Argyrea speciosa* roots produces inhibitory effects on cafeteria diet-induced obesity in rats [Shiv Kumar*, KR Alagawadi and M Raghavendra Rao (Department of Pharmacology, N.E.T. Pharmacy College, Navodaya Nagar, Raichur - 584 103, Karnataka, India), *Indian Journal of Pharmacology*, 2011, 43(2), 163-167].

NPARR 2(2), 2011-234, Evaluation of *Caesalpinia pulcherrima* Linn. for anti-inflammatory and antiulcer activities

To evaluate the ethanolic and aqueous extracts of aerial parts of *Caesalpinia pulcherrima* (Linn.) Sw. for anti-inflammatory and antiulcer activities. Anti-inflammatory action of the ethanolic and aqueous extracts of *C. pulcherrima* (100 and 200 mg/kg b.w.) (CPE and CPA) were evaluated by cotton pellet granuloma models. Pylorus ligation and aspirin

induced ulcer models were employed for evaluating antiulcer activity for both the extracts. Ulcerogenic potential of CP was also evaluated. Result : The ethanolic and aqueous extracts of *C. pulcherrima* significantly decreased ($P < 0.01$) the granuloma tissue development. CPE and CPA at both the doses exhibited significant ($P < 0.01$) antiulcer activity by decreasing the ulcer score in both the ulcer models and it was not ulcerogenic. The ethanolic and aqueous extracts of aerial parts of *C. pulcherrima* (CPE and CPA) possess significant anti-inflammatory and antiulcer activities [Vivek Sharma* and GP Rajani (Department of Pharmacology, K. L. E. Society's College of Pharmacy, Bangalore - 560 010, Karnataka, India), *Indian Journal of Pharmacology*, 2011, 43(2), 168-171].

NPARR 2(2), 2011-235, Anticataleptic and antiepileptic activity of ethanolic extract of leaves of *Mucuna pruriens*: A study on role of dopaminergic system in epilepsy in albino rats

To assess the anticataleptic and antiepileptic activity of leaves of *Mucuna pruriens* in albino rats. Haloperidol-induced catalepsy (HIC), maximum electroshock (MES) method, pilocarpine-induced Status epilepticus (PISE) and single-dose effect of *M. pruriens* were employed. *M. pruriens* (100 mg/kg) had significant anticataleptic and antiepileptic activity in HIC, MES, and PISE. *M. pruriens* extract has the potential to be an anticataleptic and antiepileptic drug. Dopamine and 5-HT may have a role in such activity [D Champatisingh, PK Sahu*, A Pal and GS Nanda (Department of Pharmacology, School of Pharmaceutical Sciences, Siksha O Anusandhan University, Bhubaneswar-751 003, Orissa, India), *Indian Journal of Pharmacology*, 2011, 43(2), 197-199].

NPARR 2(2), 2011-236, Antihyperhomocysteinemic and antihyperlipidemic effect of *Trichilia connaroides* in methionine-induced hyperhomocysteinemic animals

The current study investigates the antihyperhomocysteinemic and antihyperlipidemic effect of chloroform and methanol extracts of the leaves of *Trichilia connaroides* in methionine-induced hyperhomocysteinemic rats. Hyperhomocysteinemia was induced in albino Wistar rats by oral administration of L-Methionine (1 gm / kg) and they were treated

simultaneously with chloroform and methanol extracts (100 mg / kg) from the leaves of *Trichilia connaroides*. Serum homocysteine, lipid profile, and products of lipid peroxidation (MDA) in the heart homogenate were recorded and treated for statistical significance. Hyperhomocysteinemic animals recorded significantly elevated serum homocysteine changes in lipid profile ($P < 0.01$) and Thibarbituric acid reactive substances ($P < 0.01$), compared to the vehicle control animals. Animals treated with chloroform and methanol extracts recorded significantly ($P < 0.01$) lower serum homocysteine, entire lipid profile, LPO ($P < 0.01$), except a significant increase in HDL-cholesterol ($P < 0.01$) compared to hyperhomocysteinemic animals. Thus, we conclude that chloroform and methanol extracts of *Trichilia connaroides* have significant antihyperhomocysteinemic and antihyperlipidemic effects on methionine-induced hyperhomocysteinemic animals. *Trichilia connaroides*, therefore, holds promise as a cardioprotective herb [GS Prasanna* and Purnima Ashok (Department of Pharmacology, KLE University's College of Pharmacy, Rajajinagar 2nd Block, Bangalore - 560 010, Karnataka, India), *Indian Journal of Pharmacology*, 2011, 43(2), 203-206]

NPARR 2(2), 2011-237, Study of the antioxidant properties of extracts obtained from nopal cactus (*Opuntia ficus-indica*) cladodes after convective drying

The process of convective drying was evaluated in terms of the bioactive compounds contained in nopal samples before and after dehydration. Total polyphenol, flavonoid, flavonol, carotene and ascorbic acid contents were determined in undehydrated and dehydrated samples. Two drying temperatures (45 and 65 °C) and two air flow rates (3 and 5 m s⁻¹) were evaluated. The rheology of samples under the best drying conditions was also studied, since it provides important information regarding processing (mixing, flow processing) as well as the sensory attributes (texture) of rehydrated samples.

Non-Newtonian shear-thinning behaviour was observed for samples dried at 45 °C, while samples dried at 65 °C showed shear-thickening behaviour, possibly caused by thermal chain scission of high-molecular-weight components.

The best conditions for bioactive compound

preservation were a drying temperature of 45 °C and an air flow rate of 3 m s⁻¹, resulting in 40.97 g phenols, 23.41 g flavonoids, 0.543 g β-carotene and 0.2815 g ascorbic acid kg⁻¹ sample as shown in table 3 [Luis Medina-Torres, E Jaime Vernon-Carter, J Alberto Gallegos-Infante, Nuria E Rocha-Guzman, E E Herrera-Valencia, Fausto Calderas, and Rubén Jiménez-Alvarado* (Universidad de la Cañada, Jefatura de Carrera de Ingeniería en Agroindustrias, Carretera Teotitlán-San Antonio Nanahuatipán km 1.7 s/n, Paraje Titlacuatitla, CP 68540 Teotitlán de Flores Magón, Oaxaca, Mexico), *Journal of the Science of Food and Agriculture*, 2011, 91(6), 1001-1005].

NPARR 2(2), 2011-238, “Every mother is a mini-doctor”: Ethnomedicinal uses of fish, shellfish and some other aquatic animals in

Historically, fishers have used fish and other aquatic animals not only as food items for nutrition, but also to solve a host of physical problems and diseases. Fish and shellfish are widely used for their galactogogue and aphrodisiac properties, for quick recovery from long-time sickness, to enhance the ‘intelligence level’ of children, and to prevent and treat a host of diseases like night blindness, chicken pox, dysentery, piles, muscular inflammation, fistula, malaria, skin diseases and ‘big belly’ syndrome in children. Depending on the objective of the use, different parts of the animal body, its derivatives, or the whole animal are used. The research also clarified different forms of the recipes used. The socio-cultural construction of the ethnomedicinal uses and the distinct gender roles of the fisherwomen were analyzed.

Thus the aetiologies and the preventive measures against folk illness are socio-culturally embedded and such indigenous medical systems grow and are sustained as a situated body of knowledge within the boundaries of a typical world view framed by local culture and biodiversity [Apurba Krishna Deb*and C. Emdad Haque (Natural Resources Institute, Clayton H. Riddell Faculty of Environment, Earth and Resources, University of Manitoba, 319 Sinott Building, 70 Dysart Rd, Winnipeg, MB, Canada R3T 2N2), *Journal of Ethnopharmacology*, 2011, 134(2), 259-267].