a hepatoprotective agent. The present study was carried out to evaluate the hepatoprotective activity of ethanolic extract of bark of *Zanthoxylum armatum* DC. in CCl₄ induced hepatotoxicity in male Wistar rats. Ethanolic extracts at doses of 100, 200, and 400mg/kg were administered orally once daily for 7 days. The hepatoprotective activity was assessed using various biochemical parameters like alanine aminotransferase, aspartate aminotransferase, serum bilirubin, total protein and serum antioxidant enzymes along with histopathological studies of liver tissue. The substantially elevated serum enzymatic levels of serum transaminases, alkaline phosphatase and total bilirubin were significantly restored towards normalization by the extracts. Bark extracts significantly increased the levels of antioxidant enzymes: superoxide dismutase, catalase and glutathione. Phytochemical analysis revealed presence of isoquinoline alkaloid, berberine, as well as flavonoids and phenolic compounds, which have been known for their hepatoprotective activities. *Z. armatum* DC possesses significant protective effect against hepatotoxicity induced by CCl₄ which may be attributed to the individual or combined action of phytoconstituents present in it [Lalitsingh Ranawat, Jigar Bhatt and Jagruti Patel* (Department of Pharmacology, Institute of Pharmacy, Nirma University of Science and Technology, Sarkhej-Gandhinagar Highway, Ahmedabad 382481, India), *Journal of Ethnopharmacology*, 2010, 127(3), 777-780].

**NPARR 1(3), 2010-0521, Antidiarrhoeal activity of Zingiber officinale Rosc.**

*Zingiber officinale* (ginger) was studied for its antimicrobial profile and effect on virulent features of diarrhoeal pathogens, viz. colonization of epithelial cells and production of enterotoxins. *Z. officinale* showed no antimicrobial activity. Although it inhibited the production of cholera toxin, it had no effect on the action of this toxin. It also had no effect on the production and action of *E. coli* heat labile and heat stable toxins. However the bacterial colonization of HEp-2 cells was reduced. The results indicate that in the absence of antimicrobial action, *Z. officinale* exhibits its antidiarrhoeal activity by affecting bacterial and host cell metabolism. The present study reports a novel mechanism of action by *Z. officinale* in infectious diarrhoea [Poonam G. Daswani, S. Brijesh, Pundarikakshudu Tetali, Noshir H. Antia1, and Tannaz J. Birdi* (The Foundation for Medical Research, 84A, R.G. Thadani Marg, Worli, Mumbai 400 018, India), *Current Science*, 2010, 98(2), 222-229].

**VEGETABLES**

**NPARR 1(3), 2010-0522, Physico-chemical and pasting properties of starch from stored potato tubers**

Starch was separated from tubers of four potato (*Solanum tuberosum* Linn.) cultivars, viz. ‘Kufri Jyoti’, ‘Kufri Sindhuri’, ‘Kufri Chipsona-1’ and ‘Kufri Chipsona-2’ before and after 90 days of storage at 4, 8, 12 and 16°C and, morphological, physico-chemical and pasting properties were studied. Scanning electron microscopy showed oval and irregular shaped starch granules with average diameter of 15µm, and the granule diameter increased after storage. Peak viscosity was lower after storage at 8°C and higher at 16°C. Hot paste viscosity decreased while breakdown viscosity and set back viscosity increased after storage, and there
was no significant change in cold paste viscosity. A significant decrease in pasting time and increase in pasting temperature was observed after storage. Phosphorus content showed significant positive correlation with peak viscosity \((r = 0.452, p<0.05)\) and breakdown viscosity \((r = 0.685, p<0.01)\), and a negative correlation with amylose content \((r = 0.674, p<0.01)\). ‘Kufri Sindhuri’ starch showed significantly \((p<0.05)\) higher peak, hot paste, breakdown and cold paste viscosity. The X-ray diffraction pattern of starch showed a distinctive maximum peak and it was not affected by the cultivar or storage temperature [R.Ezekiel*, G.Rana, N.Singh and S.Singh(Division of Crop Physiology and Post-harvest Technology, Central Potato Research Institute, Shimla, 171 001, India), *Journal of Food Science and Technology*, 2010, 47(2), 60-64].

*NPARR* 1(3), 2010-0523, Effect of scale color on the antioxidant capacity of onions

The bulb onion (*Allium cepa* Linn.) has been cultivated for thousands of years and used as an important component of human diet. Recent studies suggest that onions can be used to cure, reduce, or prevent some of the health problems such as cancer, cardiovascular diseases, antidiabetic, asthma, antibiosis, and prebiotic effects due to its high antioxidant effect. In this study, the antioxidant capacities of a wide range of onion cultivars; nine commercial cultivars and five advance selections differing in color were determined. The variables tested include bulb size, scale color, total phenolic (TP), total antioxidant activity determined by both “Ferric reducing ability of plasma” (FRAP) and “Trolox equivalent antioxidant capacity” (TEAC). It was found that yellow onion had the greatest TP content (3.7mg GAE/g dw) and the red group had higher TP mean than the white group (2.2mg GAE/g dw vs. 1.1mg GAE/g dw). For the antioxidant capacity measurements, the red group had the greatest means by both methods (15.4μmol TE/g dw and 9.3μmol TE/g dw for TEAC and FRAP). Yellow onions had higher TEAC (14.7μmol TE/g dw vs. 8.7μmol TE/g dw) and FRAP values (9.8μmol TE/g dw vs. 5.6μmol TE/g dw) than white onions. Among the cultivars tested great differences of TP, TEAC and FRAP was observed. The TP content of Me-Tan 88 (8.3mg GAE/g dw) was two times higher than the yellow group. Yellow color Dayton had the greatest TEAC (20.5μmol TE/g dw) and FRAP (12.3μmol TE/g dw) means followed by yellow color Me-Tan 88 (19.4 and 11.4μmol TE/g dw). The two antioxidant measurements were found to be highly correlated (0.99) where absolute values of FRAP were about 40% less than those of TEAC. The values of TEAC and FRAP were significantly correlated by TP with similar \(r\)s (0.74 and 0.73, respectively). TP, TEAC and FRAP were significantly and positively correlated to soluble solids (0.41, 0.43, and 0.40, respectively). Our results suggested that the red onions had higher antioxidant activities than yellow and white onions although yellow onions had the richest phenolic contents [Ali Fuat Gökçe*, Cemal Kaya, Sedat Serçe and Mustafa Özgen (Department of Horticulture, Faculty of Agriculture, University of Uludag, 16059, Gorukle, Bursa, Turkey), *Scientia Horticulturae*, 2010, 123(4), 431-435].

*NPARR* 1(3), 2010-0524, 1-Methyl cyclopropene extends postharvest life of spinach leaves

Senescence of detached spinach leaves either untreated or treated with 0.1 or 1.0μLL\(^{-1}\) 1-MCP has been investigated. 1-MCP treated leaves had higher chlorophyll content and photosystem II potential quantum yield (Fv/Fm) and lower solute leakage than untreated leaves after storage in darkness at 23ºC for 6d, indicating a delay of senescence. Ethylene production was increased in spinach supplemented with 1-MCP after 3d storage and then declined to the rates of untreated leaves. 1-MCP treated spinach had higher ascorbic acid and glutathione concentrations, and a low oxidised/reduced ratio for both antioxidants. Accumulations of ammonium and protein degradation were reduced by 1-MCP. The results presented here indicate that inhibition of ethylene sensitivity can be successfully used to extend the postharvest life of spinach leaves [Gustavo Gergoff Grozeff, María E. Micieli, Facundo Gómez, Laura Fernández, Juan J. Guiamet, Alicia R. Chaves and Carlos G. Bartoli* (Instituto de Fisiología Vegetal, Universidad Nacional de La Plata-CCT CONICET La Plata, cc327 (1900) La Plata, Argentina), *Postharvest Biology and Technology*, 2010, 55(3), 182-185].
Comparison of mineral concentrations in commercially grown organic and conventional crops – Tomatoes (*Lycopersicon esculentum*) and lettuces (*Lactuca sativa*)

Trace element concentrations and stable nitrogen isotope data (δ¹⁵N%) from tomatoes (*Lycopersicon esculentum*) and lettuces (*Lactuca sativa*) were subjected to multivariate analysis in an attempt to distinguish between conventional and organic cultivation. This approach improved the correct classification of tomato samples but appears to have had a limited effect on lettuces. Our findings support the growing body of evidence which suggests that systematic differences in the concentrations of certain elements such as manganese, calcium, copper, and zinc may occur between crops cultivated under organic and conventional regimes possibly due to the presence of elevated levels of arbuscular mycorrhizal fungi (AMF) in soils cultivated organically. We assert that such differences in elemental composition may be useful as ‘indicators of authenticity’. However, we recognise the limitation that this approach may be restricted to horticultural crops where there are significant differences in agricultural practice such as conventional-hydroponic versus soil-grown organic tomatoes [Simon D. Kelly* and Alison S. Bateman (School of Environmental Sciences, University of East Anglia, Norwich NR4 7TJ, UK), *Food Chemistry*, 2010, 119(2), 738-745].

Characterization and thermal lability of carotenoids and vitamin C of tamarillo fruit (*Solanum betaceum* Cav.)

The carotenoids from yellow tamarillo were determined by high-performance liquid chromatography-photodiode array detection/mass spectrometry (HPLC-PDA/MS). Xanthophylls were found as esterified with palmitic and myristic acids. *All-trans-β*-cryptoxanthin esters and *all-trans-β*-carotene were the major carotenoids of tamarillo. Changes in carotenoid and vitamin C contents after thermal pasteurization of degassed and not degassed tomato tree nectars were studied. Zeaxanthin esters appeared to be the less thermo-labile carotenoids. Carotenoids degradation was not significantly influenced by dissolved oxygen level. However, thermal treatment induced 5, 8-epoxidation and *cis*-isomerization. Retention of ascorbic acid was total under degassed conditions while losses of dehydroascorbic acid were not affected by the initial level of dissolved oxygen [C. Mertz, P. Brat*, C. Caris-Veyrat and Z. Gunata (Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), Département PERSYST, UMR Qualisud, TA B-95/16, 34398 Montpellier Cedex 5, France), *Food Chemistry*, 2010, 119(2), 653-659].

Phenolic content and antioxidant activity of cantaloupe (*Cucumis melo*) methanolic extracts

The objectives of this study were to determine phenolic content and antioxidant activity of methanolic extracts from different parts of cantaloupe (leaf, stem, skin, seed and flesh). The flesh extract afforded the highest yield (89.6±0.3%) whilst the lowest yield was obtained from the seed (13.7±0.5%) (*p*<0.05). The leaf extract showed the highest total phenolic content (26.4±0.3mg GAE/g extract) and total flavonoid content (69.7±3.37µg RE/g extract) accompanied with best antioxidant activity through all antioxidant assays (*p*<0.05). In addition, the stem extract also exhibited good antioxidant activity. Thus, these results suggest that methanolic extracts of cantaloupe leaf and stem may serve as a potential source of natural antioxidant for food and nutraceutical application [Hajar Iqbal Ismail, Kim Wei Chan, Abdalbasit Adam Mariod and Maznah Ismail* (Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor Darul Ehsan, Malaysia), *Food Chemistry*, 2010, 119(2), 643-647].

Wood properties of juvenile and mature heartwood in *Robinia pseudoacacia* Linn.

The properties of juvenile and mature heartwood of black locust (*Robinia pseudoacacia* Linn.) was characterised in this study. Content,