capsaicinoid content, the three major capsaicinoids showing similar heat susceptibility. During storage at ambient temperature over 6 months with and without illumination, further degradation of the pungent principles by 6.8-11.9% was observed. Since residual enzyme activities were assumed to cause capsaicinoid losses, soluble peroxidase activity was investigated. It was shown that immediate thermal treatment of the plant material did not result in a complete POD inactivation even under rigorous temperature-time regimes. In contrast, a regeneration of about 30% of initial POD activity was found in those samples which were first blanched at 80°C for 5 and 10 minutes and then minced. However, no correlation between POD activity and capsaicinoid losses could be established.

Besides, microbial contamination and colour properties, the pungent principles called capsaicinoids are the major quality parameters of hot chili peppers and might be influenced by peroxidase activity. The present contribution demonstrated that heating of fresh chili pods slightly diminishes capsaicinoids, which were further reduced during storage at ambient temperature irrespective of soluble peroxidase activity. The production of high quality spices characterized by low microbial load and bright colour requires thermal treatment of the raw material; however, a slight decrease in capsaicinoid concentration cannot be excluded. To obtain chili powders with high pungent properties, thermal treatment should not be applied, however high microbial loads and enzyme activities then cannot be excluded. Considering these results and the findings of a former study, it can be concluded that blanching the whole fresh chili pods at 90 and 100°C for 5 minutes, respectively, yield moderate pungent chili powders with low microbial load and bright colour characteristics [Schweiggert Ute, Schieber Andreas and Carle Reinhold, Effects of blanching and storage on capsaicinoid stability and peroxidase activity of hot chili peppers (*Capsicum frutescens* L.), *Innov Food Sci Emerg Technol*, 2006, **7**(3), 217-224].

Honey prevents bacterial adherence to intestinal epithelial cells

In recent times, oral administration of honey to treat and protect against gastrointestinal infection such as gastritis, duodenitis and gastric ulceration caused by bacteria and rotavirus has been reported. The researchers at Department of Microbiology and Immunology, College of Medicine and Health Sciences, Sultan Qaboos University, Al-Khod, Oman evaluated the antimicrobial effect and the ability of honey to prevent *Salmonella interitidis* adhering to intestinal epithelial cells *in vitro*. Antimicrobial activity was demonstrated. Bacterial adherence was assayed using *S. interitidis* cells that had been incubated first with honey and then with the intestinal epithelial cells. Results showed that honey at dilutions up to 1:8 reduced bacterial adherence from 25.6±6.5 (control) to 6.7±3.3 bacteria per epithelial cell ($P<0.001$).

This is the first report of the ability of honey to prevent bacterial adherence *in vitro*. The findings demonstrated that the prevention of bacterial adherence caused by honey was through effect on bacteria, rather than epithelial cells. However, the fraction of the honey involved and the mechanism by which it inhibits bacterial adherence to epithelial cells are not known [Alnaqdy Adel, Al-Jabri Ali, Mahrooqi Zahra Al, Nzeako Basil and Nsanze Herbert, Inhibition effect of honey on the adherence of *Salmonella* to intestinal epithelial cells in vitro, *Int J Food Microbiol*, 2005, **103**(3), 347-351].

Antioxidant activity of *Rhizophora mangle* Linn. bark

The bark of the mangrove plant, ***Rhizophora mangle* Linn.** is used for the treatment of sore throat and against hemoptysis in pulmonary tuberculosis for its hemostatic properties. It has been reported to have antifungal activity, antibacterial activity, gastric antiulcer properties and efficacy in wound healing. The antioxidant activity of bark aqueous extract and its majoritary component and high molecular weight polyphenols' fraction were studied by researchers in Cuba using deoxyribose assay. The aqueous extract of the bark and its fraction showed antioxidant activity, achieved by the scavenging ability observed against hydroxyl radicals and iron chelating properties. The $OH^{\bullet}$ scavenging and iron chelating activities were comparable, respectively, to that of dimethyl sulfoxide and deferrioxamine mesylate. These results are in agreement with obtained effects for other plant extracts that contain polyphenols [Sánchez Janet, Melchor Gleiby, Martínez Gregorio, Escobar Arturo and Faure Roberto, Antioxidant activity of *Rhizophora mangle* bark, *Fitoterapia*, 2006, **77** (2), 141-143].

Antibacterial activity of propolis against food poisioning bacteria

Propolis is a resinous substance collected by honeybees from buds and leaves of trees and plants, mixing with pollen as well as enzymes secreted by bees. It possesses various biological properties including antimicrobial, antioxidative and antiulcer properties. The scientists of Taiwan investigated antimicrobial activity of the ethanolic extract of propolis (EEP), collected at different periods (June, August and October-November) from various regions (Taipei, Mingchien and Fanglia) in Taiwan, against *Staphylococcus aureus* — a pathogen frequently reported to produce food poisoning all over the world. The effects of cell age, incubation temperature and *p*H in response to EEP were also investigated.

It is concluded that *S. aureus* was susceptible to antibacterial action of the ethanolic extract of propolis. Susceptibility of *S. aureus* to the ethanolic extract of propolis varied with the collection location and collection time. Temperature and *p*H significantly affect the antibacterial action of EEP against *S. aureus* most effectively at *p*H 5.0 and 37°C. These results have shown that EEP may hold potential as an antimicrobial preservative. Furthermore, factors such as temperature and *p*H should be concerned when EEP is being employed in practical application in a food system for its antibacterial activity [Lu Li-Chang, Chen Yue-Wen and Chou Cheng-Chun, Antibacterial activity of propolis against *Staphylococcus aureus*, *Int J Food Microbiol*, 2005, **102** (2), 213-220].

Antidiarrhoeal activity of *Cyperus rotundus*

Infusion of the Nut Grass, ***Cyperus rotundus* Linn.** (Hindi — *Motha*) rhizome has been used in pain, fever, diarrhoea, dysentery and other intestinal problems. Researchers at Khulna, Bangladesh and Manchester, UK conducted investigations to study its antidiarrhoel activity. The methanol extract of its rhizome, given orally at the doses of 250 and 500 mg/kg b.w., showed significant antidiarrhoeal activity in castor oil induced diarrhoea in mice. Among the fractions, tested at 250 mg/kg, the petroleum ether fraction and residual methanol fraction were found to retain the activity, the latter being more active as compared to the control. The ethyl acetate fraction did not show any antidiarrhoeal activity. Further studies are required to identify the active principle(s) accounting for such activity [Uddin SJ, Mondal K, Shilpi JA and Rahman MT, Antidiarrhoeal activity of *Cyperus rotundus*, *Fitoterapia*, 2006, **77**(2), 134-136].

Antiplatelet property of active constituent of turmeric

Plant extracts may be an alternative to currently used antiplatelet agents, because they constitute a rich source of bioactive chemicals. Since, many of them are largely free from adverse effects and have excellent pharmacological actions, they could lead to the development of new classes of possibly safer and antiplatelet agents. Additionally, some flavonoids and polyphenols are found to have effective inhibitory activities of platelet aggregation induced by collagen. Therefore, much effort has been focused on the plant materials for potentially useful products as commercial antiplatelet agents or lead compounds. In East Asia, the rhizome of turmeric, ***Curcuma longa* Linn.** (Family — Zingiberaceae) has long been considered to have natural medicinal properties such as, an analgesic in the treatment of menstrual disorders, rheumatism and traumatic diseases

because it contains a number of monoterpenoids, sesquiterpenoids and curcuminoids.

The antiplatelet activities of turmeric rhizome-derived materials were measured using a platelet aggregometer and compared with those of Aspirin as antiplatelet agent by researchers at Faculty of Applied Biotechnology and Research Center for Industrial Development of Biofood Materials, College of Agriculture, Chonbuk National University, Chonju, Republic of Korea. The active constituent from the rhizome of turmeric was isolated and characterized as *ar*-turmerone by various spectral analyses. At 50% inhibitory concentration (IC_{50}) value, *ar*-turmerone was effective in inhibiting platelet aggregation induced by collagen (IC_{50}, 14.4 μM) and arachidonic acid (IC_{50}, 43.6 μM). However, *ar*-turmerone had no effect on platelet activating factor or thrombin induced platelet aggregation. In comparison, *ar*-turmerone was significantly more potent platelet inhibitor than aspirin against platelet aggregation induced by collagen. These results suggested that *ar*-turmerone could be useful as a lead compound for inhibiting platelet aggregation induced by collagen and arachidonic acid [Lee HS, Antiplatelet property of *Curcuma longa* L. rhizome-derived *ar*-turmerone, *Bioresour Technol*, 2006, **97** (12), 1372-1376].

Beet root exhibits hepatoprotective activity

Despite extensive research in medical field, no drug in the modern system of medicine can be claimed to cure liver disorders, which, in many times, become fatal. Extracts of some plants, viz. ***Picrorrhiza kurroa* Royle ex Benth., *Andrographis paniculata* Wall. ex Nees and *Eclipta alba* (Linn.) Hassk.,** have been reported to possess clinically useful hepatoprotective activity. However, many plants remain unexplored in this regard. At present, one of the plant-derived medicines approved for use in liver cirrhosis and alcoholic liver diseases is silymarin. There are number of studies

which conclude the efficacy of silymarin in these conditions. Silymarin is a mixture of flavonolignans obtained from the fruits of ***Silybum marianum* Gaertn.** that has been known since ancient time and recommended in traditional European and Asian medicine mainly for the treatment of liver disorder.

To find out possible hepatoprotective activity in beet root, ***Beta vulgaris* Linn.** (Hindi — *Chukandar*) a study was conducted by researchers in India using silymarin as positive control to compare the efficacy against CCl_4-induced hepatotoxicity. Ethanolic extract of beet roots given orally at doses of 1000, 2000 and 4000 mg/kg exhibited significant dose-dependent hepatoprotective activity against carbon tetrachloride (CCl_4)-induced hepatotoxicity

in rats. Hepatotoxicity and its prevention were assessed by serum markers, viz. cholesterol, triglyceride, alanine amino transferase and alkaline phosphatase. Identification of chemical constituents along with their effects will be of great help in understanding the hepatoprotective activity of the ethanolic extract of beet root [Agarwal M, Srivastava VK, Saxena KK and Kumar A, Hepatoprotective activity of *Beta vulgaris* against CCl_4-induced hepatic injury in rats, *Fitoterapia*, 2006, **77**(2), 91-93].

Neem leaf extract could protect from prostate cancer

***Azadirachta indica* A. Juss.** (Neem tree) has been used for various ailments including tumours by traditional practioners throughout Southeast Asia. Prostate cancer (PC) is the most prevalent cancer and the leading cause of male cancer death, hence, the scientists of Dr. ALM PGIBMS, University of Madras, Taramani, Chennai, India and Department of Biotechnology, Karpagam Arts and Science college, Coimbatore, India investigated the efficacy of ethanolic extract of neem leaves against prostate cancer cells. The extract caused cell death of prostate cancer cells (PC-3) by inducing apoptosis as evidenced by a dose-dependent increase in DNA fragmentation and a decrease in cell viability. Western blot studies indicated that treatment with neem extract showed decreased level of Bcl-2, which is anti-apoptotic protein and increased the level of Bax protein. Thus, the neem extract could be potentially effective against prostate cancer treatment [Kumar Suresh, Suresh PK, Vijayababu MR, Arunkumar A and Arunakaran J, Anticancer effects of ethanolic neem leaf extract on prostate cancer cell line (PC-3), *J Ethnopharmacol*, 2006, **105**(1-2), 246-250].

Effect of *Urtica dioica* Linn. extract intake upon blood lipid profile

Urtica dioica* Linn.** (Hindi — *Bichhu booti*), also known as Stinging Nettle, is a perennial herb. The whole plant is known as antiasthmatic, diuretic, haemostatic, hypotensive, hypoglycaemic and antidandruff. Moreover, an infusion of the plant is very valuable in stemming internal bleeding. Till now, no reports have dealt with the effect of its extracts upon blood lipids. Apolipoprotein B (Apo B), a surface marker of very-low-density lipoprotein (VLDL) and low-density lipoprotein (LDL), has been shown to be a better predictor of coronary heart disease (CHD) than other markers, such as LDL and total cholesterol, especially in individuals with low or normal LDL-cholesterol. Researchers at School of Arts and Sciences, Natural Science Division, Lebanese American University, Lebanon conducted studies to evaluate the effect of a month period of chronic intake of water and petroleum ether extracts of ***U. dioica upon blood lipid profile, focusing on Apo B as a marker of atherogenicity. The study was conducted on rats fed with either a normal or high-fat atherogenic diet. Aqueous (150 mg/kg/day) and to a lesser extent petroleum ether (20 mg/kg/day) extract was given for 30 days to rats fed with normal or high-fat diet, improved the blood lipid profile. Significant decreases in total cholesterol, LDL cholesterol, LDL / HDL cholesterol ratio and plasma total Apo B were observed. Assessment of GOT, GPT and LDH activities showed that no liver damage has occurred during the study period. Thus, taking into consideration all these parameter, aqueous and to a lesser extent petroleum ether extract of ***U. dioica*** help in improving the lipid profile in normolipidemic rats fed with a regular or a high-fat diet [Daher Costantine F, Baroody Karmen G and Baroody George M, Effect of *Urtica dioica* extract intake upon blood lipid profile in the rats, *Fitoterapia*, 2006, **77**(3), 183-188].

Shrubby Basil essential oil activity varies seasonally

The efficacy of various medicinal herbs varies according to season is reported in different Ayurvedic books. The scientists in Brazil evaluated the effects of seasonal variation on the central nervous system activity of Shrubby Basil essential oil. ***Ocimum gratissimum* Linn.**, (Shrubby Basil; Hindi-*Ban tulsi*) and other species of the same genus are used as medicines to treat central nervous system (CNS) diseases, commonly encountered in warm regions of the world. The chemical composition of the essential oil varies according to their chemotypes: timol, eugenol or geraniol. The essential oil type eugenol was extracted by hydrodistillation in each of the four seasons of the year. Activity upon CNS was evaluated in the open-field and rota-rod tests; sleeping time induced by sodium pentobarbital (40mg/kg, intra-peritoneally, i.p.) and anticonvulsant activity against seizures induced by both pentylenetetrazole (85mg/kg, s.c.) and maximal electroshock (50mA, 0.11second) were determined. Essential oils obtained in each season were effective in increasing the sleeping duration and a preparation obtained in Spring was able to protect animals against tonic seizures induced by electroshock. In each season, eugenol and 1,8-cineole were the most abundant compounds and in Spring the essential oil presented the greatest relative percentage of sesquiterpenes, suggesting that these compounds could explain the differences observed in the biological activity in essential oils obtained in different seasons of the year [Freire Cristiana M Murbach, Marques Márcia Ortiz M and Costa Mirtes, Effects of seasonal variation on the central nervous system activity of *Ocimum gratissimum* L. essential oil, *J Ethnopharmacol*, 2006, **105**(1-2), 161-166].

Hypoglycaemic and antidiabetic effect of Custard apple leaves

The researchers at Alternative Therapeutics Unit, Drug Development Division, Department of Chemistry, University of Allahabad, Allahabad, India and Dr. B.R. Ambedkar Center for Biomedical Research, University of Delhi, Delhi, India conducted studies on hypoglycaemic and antidiabetic properties of the ethanolic extract of Custard apple (***Annona squamosa* Linn.**; Hindi — *Shariffa*) leaves. The extract was administered orally at different doses to normal as well as streptozotocin (STZ)-induced diabetic rats and alloxan-induced diabetic rabbits. The dose of 350mg/kg body weight (bw) reduced the fasting blood glucose (FBG) level by 6.0% within 1 hour, whereas, the peak blood glucose at 1 hour during glucose tolerance test (GTT) was reduced by 17.1% in normal rats. The same dose of ethanolic extract reduced FBG by 26.8% and improved glucose tolerance by 38.5 and 40.6% at 1 and 2 hour, respectively, during GTT in alloxan-induced diabetic rabbits. In STZ-diabetic rats, a fall of 13.0% in FBG and an improvement in glucose tolerance by 37.2 and 60.6% at 1 and 2 hour, respectively, was observed during GTT. The dose of 350mg/kg bw of ethanolic extract in 10-day treatment of a group of STZ-diabetic rats produced 73.3% fall in FBG level and no sugar was observed in fasting urine. Treatment of severely-diabetic rabbits for 15 days with a dose of 350mg/kg of extract reduces FBG by 52.7% and urine sugar by 75%. It brought about fall in the level of total cholesterol (TC) by 49.3% with increase of 30.3% in high-density lipoprotein (HDL) and decrease of 71.9 and 28.7% in low-density lipoprotein (LDL) and triglycerides (TG) levels, respectively [Gupta Rajesh Kumar, Kesari Achyut Narayan, Murthy PS, Chandra R, Tandon V and Watal Geeta, Hypoglycaemic and antidiabetic effect of ethanolic extract of leaves of *Annona squamosa* L. in experimental animals, *J Ethnopharmacol,* 2005, **99**(1), 75-81].

Anti-snake venom properties of tamarind seed extract

In Indian traditional medicine, various plants have been used widely as a remedy for treating snakebites and some sour material is applied on animal bite. The scientists at Department of Biochemistry and Department of Biotechnology & Seed Pathology, University of Mysore, Manasagangothri, Mysore, India conducted studies on tamarind (***Tamarindus indica* Linn.**) seed extract to find out its potential as anti-snake venom remedy as well as the enzymatic effects induced by V*ipera russelli* venom. Ethanolic extract of tamarind seed inhibited the PLA_2, protease, hyaluronidase, l-amino acid oxidase and 5-nucleotidase enzyme activities of venom in a dose-dependent manner. These are the major hydrolytic enzymes responsible for the early effects of envenomation, such as local tissue damage, inflammation and hypotension. Furthermore, the extract neutralized the degradation of the B^{β} chain of human fibrinogen and indirect hemolysis caused by venom. It was also observed that the extract exerted a moderate effect on the clotting time, prolonging it only to a small extent. Edema, haemorrhage and myotoxic effects including lethality induced by venom were neutralized significantly when different doses of the extract were pre-incubated with venom before the assays. On the other hand, animals that received extract 10 minutes after the injection of venom were protected from venom induced toxicity. Since, it inhibits hydrolytic enzymes and pharmacological effects, it may be used as an alternative treatment to serum therapy and, in addition, as a rich source of potential inhibitors of PLA_2, metalloproteinases, serine proteases, hyaluronidases and 5¢-nucleotidases, the enzymes involved in several physiopathological human and animal diseases [Ushanandini S, Nagaraju S, Harish Kumar K, Vedavathi M, Machiah DK, Kemparaju K, Vishwanath BS, Gowda TV and Girish KS, The anti-snake venom properties of *Tamarindus indica* (leguminosae) seed extract, *Phytother Res*, 2006, **20**(10), 851-858].

Evaluation of *ghee* based formulation for wound healing activity

Ghee, an important *Panchgavya* component, bears several medicinal claims and many of its combinations with herbs are reported in ancient texts. One of the most widely circulated and well-known properties of *ghee* is its wound healing activity. Hence, the researchers at Department of Pharmaceutical Sciences, Nagpur University, Nagpur, India systematically evaluated this claim with regard to *ghee* in combination with antibiotic. The objective of this work is to verify the hypothesis that cows *ghee* provides better tissue formation than Neomycin.

Ointments were prepared by dissolving neomycin sulphate, methyl paraben, propyl paraben and sodium bisulphite in aqueous vehicle. Glyceryl monostearate, cetylalchol, liquid paraffin, hard paraffin and *ghee* were taken in a separate beaker and heated to 70°C. The two phases were mixed together at same temperature without vortexing to avoid the entrapment of air. After cooling to 30-40°C, the ointments were homogenized using a Silverson homogenizer at 1500rpm for 40minutes. The most stable ointment bases were selected and then five formulations, which are stable at accelerated conditions, are selected for further evaluation.

Formulation containing Neomycin and *ghee* was evaluated for wound-healing potential on different experimental models of wounds in rats. The rats were divided into six groups: group 1 as control, group 2 as treated with neomycin only, group 3 as treated only with *ghee*, group 4 treated with F-1 formulation containing *ghee* 40% and Neomycin 0.5%, group 5 treated with F-2 formulation containing *ghee* 50% and Neomycin 0.5% and group 6 treated with F-3 formulation containing *ghee* (50%) and simple ointment base, in all two wound models, each group consisting of six rats. Wound contraction ability in excision wound model was measured at different time intervals and study was continued until wound is completely

healed. Tensile strength was measured in 10-day-old incision wound and quantitative estimation of hydroxy proline content in the healed tissue was determined in 10-day-old excision wound. Histological studies were done on 10-day-old sections of regenerated tissue of incision wound. F-2 formulation containing *ghee* 50% and Neomycin 0.5% showed statistically significant response, in terms of wound contracting ability, wound closure time, period of epithelization, tensile strength of the wound, regeneration of tissues at wound site when compared with the control group and these results were comparable to those of a reference Neomycin ointment [Prasad Vure and Dorle Avinash Kumar, Evaluation of ghee based formulation for wound healing activity, *J Ethnopharmacol*, 2006, **107**(1), 38-47].

Antiulcerogenic property of mango flowers

In traditional medicine Mango (***Mangifera indica* Linn.)** flowers are used for gastrointestinal disorders; to validate this claim the scientists of Brazil, University of Panama and University of San Carlos, Guatemala City, Guatemala conducted studies to determine the effect of flowers decoction on the acute and subacute models of induced ulcer in mice and rats. A single oral administration of the aqueous decoction (AD) up to a dose of 5g/kg, p.o. did not produce any signs or symptom of toxicity in the treated animals. The oral pre-treatment with AD (250, 500 and 1000mg/kg) in rats with gastric lesions induced by ethanol, decreased the gastric lesions from 89.0±6.71 (control group) to 9.25±2.75, 4.50±3.30 and 0, respectively. Phytochemical screening showed the presence of steroids, triterpenes, phenolic compounds and flavonoids. Estimation of the global polyphenol content in the AD was performed by Folin-Ciocalteu method and showed approximately 53% of total phenolic in the extract. Thus, the results support the potential gastroprotective and ulcer-healing properties of aqueous decoction of mango flowers [Lima ZP, Severi JA, Pellizzon CH, Brito ARMS, Solis PN, Cáceres A, Girón LM, Vilegas W and Hiruma-Lima CA, Can the aqueous decoction of mango flowers be used as an antiulcer agent? *J Ethnopharmacol*, 2006,**106**(1), 29-37].

Cardioprotective effects of chocolate and almond consumption

The scientists at Department of Nutrition and Hospitality Management, Syracuse University, Syracuse, New York, USA evaluated the potentially synergistic or additive effects of combining consumption of dark chocolate with almonds as part of a low-fat diet on circulating levels of serum lipids and inflammatory markers: intercellular adhesion molecule (ICAM), vascular adhesion molecule and high-sensitivity C-reactive protein. A 6-week, 4-armed parallel design was used; 49 healthy normocholesterolemic women participated in this study. Subjects were randomized to 1 of 3 treatments: chocolate (41 g/day), almonds (60 g/day), chocolate and almonds, or control (no chocolate or almonds). All subjects followed the National Cholesterol Education Program Therapeutic Lifestyle Changes diet and improved dietary intakes in accordance with guidelines; no subjects gained or lost weight. Serum cholesterol concentrations showed no changes after 6 weeks; however, triacylglycerol levels were reduced by approximately 21, 13, 19, and 11% ($P < .05$), in the chocolate, almond, chocolate and almond, and control groups, respectively. Circulating ICAM levels decreased significantly by 10% in the treatment group consuming chocolate only ($P = .027$). No significant changes were observed for vascular adhesion molecule and high-sensitivity C-reactive protein levels in any treatment group. No synergistic or additive effects were observed when both products were consumed. Thus the study revealed that consumption of chocolate and almonds for 6 weeks showed no harmful effects in healthy women; all dietary modifications improved serum triacylglycerol levels, and consumption of chocolate reduced levels of circulating ICAM [Kurlandsky Sara B and Stote Kim S, Cardioprotective effects of chocolate and almond consumption in healthy women, *Nutr Res,* 2006, **26**(10), 509-516].

Cancer chemoprevention by garlic

Garlic is an ancient remedy for a variety of diseases and recently many epidemiological studies have supported the protective role of garlic and related allium foods against the development of certain human cancers. The scientists in USA evaluated anticancerous effect of natural garlic and garlic cultivated with selenium fertilization on laboratory animals. Organoselenium compounds synthesized in laboratory were compared with their sulfur analogs for chemopreventive efficacy. Diallyl selenide was at least 300-fold more effective than diallyl sulfide in protecting against 7, 12-dimethylbenz[a]anthracene (DMBA)-induced mammary adenocarcinomas in rats. In addition, benzyl selenocyanate inhibited the development of DMBA-induced mammary adenocarcinomas and azoxymethane-induced colon cancer in rats and benzo[a]pyrene-induced forestomach tumours in mice. The sulfur analog, benzyl thiocyanate, had no effect under the same experimental conditions. Furthermore, it was observed that 1,4-phenylenebis(methylene)- selenocyanate, but not its sulfur analog, significantly inhibited DMBA-DNA adduct formation and suppressed DMBA-induced mammary carcinogenesis. Collectively, these results indicate that structurally distinctive organoselenium compounds are superior to their corresponding sulfur analogs in cancer chemoprevention. Additionally, synthetic aromatic selenocyanates are more effective cancer chemopreventive agents than the naturally occurring selenoamino acids. Because plants are capable of utilizing selenium in a manner similar to that in sulfur assimilation pathways, future studies should aim at determining whether, under appropriate conditions, these potent cancer chemopreventive synthetic selenium compounds can be synthesized by garlic and related allium foods [El-Bayoumy K, Sinha R, Pinto JT and Rivlin RS, Cancer chemoprevention by garlic and garlic-containing sulfur and selenium compounds, *J Nutr*, 2006, **136**(3), 864S-869S].

Anthelmintic activity of *Calotropis procera* flowers in sheep

The flowers of ***Calotropis procera* (Ait.) R. Br.**, a common weed possessing many medicinal properties, were subjected to study for potential anthelmintic activity in sheep. The scientists at Department of Veterinary Parasitology and Department of Clinical Medicine and Surgery, University of Agriculture, Faisalabad, Pakistan studied and compared its anthelmintic activity with Levamisole through *in vitro* and *in vivo* studies. *In vitro* studies revealed anthelmintic effects ($P<0.05$) of crude aqueous (CAE) and crude methanolic extracts (CME) of flowers on live *Haemonchus* (*H.*) *contortus* as evident from their mortality or temporary paralysis. For *in vivo* studies, flowers were administered as crude powder (CP), CAE and CME to sheep naturally infected with mixed species of gastrointestinal nematodes. Egg count per cent reduction (ECR) was recorded as 88.4 and 77.8% in sheep treated with CAE and CP at 3g/kg body weight on day 7 and 10 post-treatment (PT), respectively. CME was least effective resulting in 20.9% reduction in ECR on day 7 PT. It was found that flowers possess good anthelmintic activity against nematodes, yet it was lower than that exhibited by Levamisole. It is suggested that further research on large scale should be carried out involving a large number of animals, doses higher than those used in the current study, identification of active principles, and standardization of dose and toxicity studies for drug development [Iqbal Zafar, Lateef Muhammad, Jabbar Abdul, Muhammad Ghulam and Khan Muhammad Nisar, Anthelmintic activity of *Calotropis procera* (Ait.) Ait. f. flowers in sheep, *J Ethnopharmacol*, 2005, **102**(2), 256-261].

Antidiabetic effect of aqueous and ethanolic extracts of *Pan* leaves

Betel, ***Piper betle*** **Linn.** (Hindi—*Pan*) leaves are widely used as a masticatory and possess several bioactivities. However, its antidiabetic activity has not been scientifically investigated so far. Hence, the research workers of Sri Lanka investigated the antidiabetic activity of its leaves. This was tested in normoglycaemic and strepozotocin (STZ)-induced diabetic rats using oral administration of hot water extract (HWE) and cold ethanolic extract (CEE). In normoglycaemic rats, both HWE and CEE significantly lowered the blood glucose level in a dose-dependent manner. In glucose tolerance test, both extracts markedly reduced the external glucose load. The antidiabetic activity of HWE is comparable to that of CEE. Moreover, HWE failed to inhibit the glucose absorption from the small intestine of rats. Both extracts were found to be non-toxic and well tolerated after following chronic oral administration (no overt signs of toxicity, hepatotoxicity or renotoxicity). However, the weight of the spleen had increased in treated groups possibly indicating lymphoproliferative activity. It is concluded that HWE and CEE of betel leaves possess safe and strong antidiabetic activity [Arambewela LSR, Arawwawala LDAM and Ratnasooriya WD, Antidiabetic activities of aqueous and ethanolic extracts of *Piper betle* leaves in rats, *J Ethnopharmacol*, 2005, **102**(2), 239-245].

Psyllium decreases serum glucose and glycosylated hemoglobin in diabetics

Psyllium, ***Plantago ovata*** **Forsk.** (Hindi — *Isabgol*) an ancient laxative is high in both fibre and mucilage. The beneficial effect of dietary fibre in the management of type II diabetes, has not been totally demonstrated. Hence, the research workers of Iran conducted study to determine the plasma-lowering effects of 5.1g b.i.d. of psyllium husk fibre, as an adjunct to dietary and drug therapy on lipid and glucose levels, in patients with type II diabetes. Patients were randomly selected from an outpatient clinic of primary care to participate in a double-blind placebo-controlled study in which, psyllium or placebo was given in combination with their anti-diabetic drugs. Forty-nine subjects were included in the studies that were given diet counseling before the study and then followed for 8 weeks in the treatment period. Fasting plasma glucose (FBS) was measured every 2 weeks, and total plasma cholesterol (TC), LDL-cholesterol (LDL-C), HDL-cholesterol (HDL-C), triglyceride (TG) and insulin levels were measured every 4 weeks. Glycosylated hemoglobin (HbA1c) was also measured at the beginning and ending of the study. The test products (psyllium or placebo) were supplied to subjects in identically labeled foil packets containing a 5.1g dose of product, to consume two doses per day, half an hour before breakfast and dinner. Both products were well tolerated, with no serious adverse events related to treatment was reported in either. Better gastric tolerance to Metformin was recorded in the psyllium group. FBS and HbA1c showed a significant reduction ($P<0.05$), whereas HDL-C increased significantly ($P<0.05$) following psyllium treatment. LDL/HDL ratio was significantly decreased ($P<0.05$). The results showed that 5.1g b.i.d. of psyllium for persons with type II diabetes is safe, well tolerated and improves glycaemic control [Ziai Seyed Ali, Larijani Bagher, Akhoondzadeh Shahin, Fakhrzadeh Hossein, Dastpak Arezoo, Bandarian Fatemeh, Rezai Afsaneh, Naghdi Badi Hassanali Hassanali and Emami Tara, Psyllium decreased serum glucose and glycosylated hemoglobin significantly in diabetic outpatients, *J Ethnopharmacol*, 2005, **102**(2), 202-207].

Antimicrobial and phytochemical studies on *Pedilanthus tithymaloides*

Slipper plant, ***Pedilanthus tithymaloides*** **(Linn.) Poit.** (Family—*Euphorbiaceae*) is used as antitumoral, abortive and to treat sore throat. The antibacterial and antifungal properties of ethanolic extract of the leaves and some of its constituents were investigated by researchers of Brazil by Broth

microdilution method using Mueller-Hinton and RPMI-1640 medium for antibacterial and antifungal assays, respectively. Ethanol extract of the dried leaves contains, 5′-*S*-methylthioadenosine, gluconic acid, 1,4-dihydroquinone, nicotinamide and proline. 5′-*S*-Methylthioadenosine exhibited a strong activity against all tested bacteria. 1,4-dihydroquinone inhibited *Staphylococcus aureus* and *Bacillus subtilis* and also *Pseudomonas aeruginosa* and *Escherichia coli*. No extractives were found active against fungi [Vidottia Gentil José, Zimmermanna Alberto, Sarragiottoa Maria H, Nakamurab Celso V and Filhob Benedito P Dias, Antimicrobial and phytochemical studies on *Pedilanthus tithymaloides*, *Fitoterapia*, 2006, **77**(1), 43-46].

Acute toxicity and diuretic properties of *Rungia repens*

***Rungia repens* (Linn.) Nees** (Family — Acanthaceae), a herb popularly known in Tamil as *Kodagasalai* and in Sanskrit as *Parpata* is found growing as a shade loving weed in moist places, sides of water channels, bunds of paddy fields and also under the shadow area of coconut tree. It has been said to be useful as an internal and external remedy as antipyretic, diuretic, vermifugal and applied to the scalp in cases of *Tinea capitis*. In a study carried out by researchers in India the ethanolic extract of its aerial parts (300 and 600 mg/kg, p.o) showed diuretic activity in rats supporting the traditional use. Orally administered to mice in doses from 100 to 3000 mg/kg, the ethanolic extract produced sedation, increased urination and defecation at all tested doses. There was no mortality in any of the above mentioned doses at the end of the 14 days of observation. The acute toxicity, orally evaluated in mice, was found to be higher than 3000 mg/kg [Basu SK and Arivukkarasu R, Acute toxicity and diuretic studies of *Rungia repens* aerial parts in rats, *Fitoterapia*, 2006, **77** (2), 83-85].

Antidiabetic potential of *Butea monosperma*

***Butea monosperma* (Lam.) Kuntze** is a medium sized tree commonly found throughout India, except in the arid regions. Its flowers are reported to possess astringent, diuretic, depurative, aphrodisiac and tonic properties. Anticonvulsive, anti-implantation and antihepatotoxic activities of flowers are also documented. Moreover, preliminary studies have indicated hypoglycaemic activity of its flowers. Thus, the effect of ethanolic extract of flowers on blood glucose and biochemical parameters such as serum cholesterol, HDL-cholesterol, total protein, albumin, triglyceride and alkaline phosphatase were investigated in normal, glucose-loaded rats and alloxan-induced diabetic rats by researchers in India. Single dose treatment of ethanolic extract (200 mg/kg, p.o.) significantly improved glucose tolerance and caused reduction in blood glucose level in alloxan-induced diabetic rats. Repeated oral treatment with this extract (200 mg/kg/day) for 2 weeks significantly reduced blood glucose, serum cholesterol and improved HDL-cholesterol and albumin as compared to diabetic control group. Since, ethanolic extract was found to possess antihyperglycaemic effect without causing hypoglycaemia in normal rats, it can be speculated that this effect may be due to increased peripheral glucose utilization. Further pharmacological and biochemical investigations are underway to evaluate the mechanism of the antidiabetic effect of ethanolic extract [Somani Rahul, Kasture Sanjay and Singhai Abhay Kumar, Antidiabetic potential of *Butea monosperma* in rats, *Fitoterapia*, 2006, **77** (2), 86-90].

Palas seeds exhibit anthelmintic activity in sheep

Flame of the forest, ***Butea monosperma*** **(Lam.) Kuntze** (Hindi — *Palas*) is traditionally used for worms, constipation, piles, diabetes and congested throat. Therefore, it seems that its use in the ethno-veterinary system of Pakistan as an anthelmintic agent is justified, particularly by the sheep farmers who do not have access to modern anthelmintics due to their non-availability or high cost. However, the dose of *Palas* to be used for its anthelmintic effect needs to be standardized for different animal species because a dose (1.0 g/kg) that proved highly effective against *Ascaridia galli* in poultry and against hookworms in dogs, did not work against *Haemonchus contortus* or *Oesophagostomum columbianum* in sheep. Hence, researchers in Pakistan conducted investigations in this direction and noted that seeds administered as crude powder (CP) at doses of 1, 2 and 3 g/kg to sheep naturally infected with mixed species of gastrointestinal nematodes (*H. contortus*, *Trichostrongylus colubriformis*, *T. axei*, *O. columbianum*, *Strongyloides papillosus* and *Trichuris ovis*) exhibited a dose and a time-dependent anthelmintic effect. The maximum reduction of 78.4% in eggs per gram of feces (EPG) was recorded on day 10 after treatment with 3 g/kg. Levamisole (7.5 mg/kg), a standard anthelmintic agent, exhibited 99.1% reduction in EPG [Iqbal Zafar, Lateef Muhammad, Jabbar Abdul, Ghayur Muhammad Nabeel and Gilani Anwarul Hassan, *In vivo* anthelmintic activity of *Butea monosperma* against *Trichostrongylid nematodes* in sheep, *Fitoterapia*, 2006, **77**(2), 137-140].

Antioxidative and antimutagenic properties of fruit rinds of *Garcinia pedunculata* Roxb.

Diet rich in fruits and vegetables has been associated with preventing mutagenesis and cancer and other health benefits. Hexane and chloroform extracts from the fruit rinds of ***Garcinia pedunculata*** **Roxb.** were tested for their antioxidative and antimutagenic activities by researchers at Central Food Technological Research Institute, Mysore, India. Both the hexane and chloroform extracts showed antioxidant activity studied through β-carotene-linoleate model system and α, α-diphenyl-β-picrylhadrazyl (DPPH) method at various concentrations. At 500 ppm concentration, in case of β-carotene-linoleate model system, the hexane and chloroform extracts showed 60 and 67% antioxidant activity, respectively, whereas the free radical scavenging activity was 45 and 65%, respectively with DPPH method. The antimutagenicity of the hexane and chloroform extracts against the mutagenicity of direct acting mutagen sodium azide was determined by the Ames test. Both the extracts showed strong antimutagenicity at or above 1250 µg/plate in the tester strains of *Salmonella typhimurium* (TA100 and TA1535). However, the hexane extract showed higher antimutagenic potential than the chloroform extract. The hexane extract from the fruit rinds showed lower antioxidant activity and higher antimutagenic activity. On the other hand chloroform extracts had higher antioxidant activity and lowerantimutagenic activity.

The antioxidant and antimutagenic properties of the extracts from the fruit rinds of this plant have been documented for the first time. These extracts can be utilized as nutraceuticals and as natural food biopreservatives. Moreover, the fruit rinds of ***G. pedunculata*** are rich in (–)-hydroxycitric acid (HCA), which is a proven natural antiobese agent. After extractions of these bioactive fractions, the residuals can be used for HCA extraction [Jayaprakasha GK, Negi PS and Jena BS, Antioxidative and antimutagenic activities of the extracts from the rinds of *Garcinia pedunculata*, *Innov Food Sci Emerg Technol*, 2006, **7**(3), 246-250].