Anti-diabetic activity of Shoe flowers

_Hibiscus rosa-sinensis_ Linn. is an evergreen woody, glabrous, showy shrub, distributed throughout India and called as Shoe flower plant or Chinese hibiscus. It is reputed for various properties in traditional medicine. To validate and support the claims by traditional medicine practitioners about the usefulness of its flowers for the treatment of diabetes the researchers at India investigated the antidiabetic activity of these flowers in alloxan induced diabetic rats. The ethanol extract of flowers at doses of 250mg/kg and 500mg/kg was found to significantly reduce the blood glucose level in both acute (1, 3, 5 h) and sub acute (1, 3, 5, 7 days) treatments [Venkatesh S, Thilagavathi J and Shyam Sundar D, Anti-diabetic activity of flowers of _Hibiscus rosa-sinensis_, _Fitoterapia_, 2008, 79 (2), 79-81].

Anti-inflammatory activity of Flame of forest flowers

Flowers of _Butea monosperma_ (Lam.) Kuntz, known as Flame of forest is commonly available in Indian market. Traditionally most of the plant parts are used therapeutically in treatment of various diseases. The researchers at Prin. K. M. Kundnani College of Pharmacy, Colaba, Mumbai, India evaluated the effect of methanolic extract of its flowers (MEBM) for anti-inflammatory activity against carrageenin induced paw edema and cotton pellet granuloma in albino rats. In carrageenin induced paw edema, MEBM at oral doses of 600 and 800mg/kg, dose-dependently inhibited the paw edema. In cotton pellet induced granuloma, MEBM at the same doses was found to significantly inhibit granuloma tissue formation, including significant reduction in levels of serum lysosomal enzymes (SGOT, SGPT and ALP) and lipid peroxides as compared to control [Shahavi VM and Desai SK, Anti-inflammatory activity of _Butea monosperma_ flowers, _Fitoterapia_, 2008, 79 (2), 82-85].

Antioxidant activity and phenolic content of various Date palm fruits from Iran

Edible parts of Date palm fruits (DPF) (_Phoenix dactylifera_ Linn.) from Iran were analyzed by scientists at Food Technology Division, School of Industrial Technology, Universiti Sains Malaysia, Minden, Penang, Malaysia for their antioxidant activities (AA) using Trolox equivalent antioxidant capacity (TEAC) method, 2,2'-azinobis (3-ethylbenzothiazoline-6-sulphonic acid) radical cation (ABTS+) assays and the ferric reducing/antioxidant power method (FRAP assay). The total phenolic content (TPC) and total flavonoid content (TFC) of the DPF were measured using Folin-Ciocalteau and aluminum chloride colorimetric methods, respectively. The samples used included four types of soft dates (SD) namely ‘Honey date’, ‘Bam date’, ‘Jiroft date’ and ‘Kabkab date’; three types of semi-dry dates (SDD) namely ‘Sahroon date’, ‘Piarom date’ and ‘Zahedi date’ and one type of dry date (DD) which was ‘Kharak date’. The AA (ABTS assay) of the DPF were 22.83-41.17, 47.6-54.61 and 500.33 µmol Trolox equivalents/100g dry weights (dw) for SD, SDD and DD, respectively. The AA (FRAP assay) per 100g dw sample were 11.65-20, 19.12-29.34 and 387.34 µmol FRAP for SD, SDD and DD, respectively. The TPC ranged from 2.89 to 4.82, 4.37 to 6.64 and 141.35mg gallic acid equivalents (GAE)/100g dw, while TFC ranged from 1.62 to 3.07, 1.65 to 4.71 and 81.79mg catechin equivalents (CEQ)/100g dw sample for SD, SDD and DD, respectively. Correlation analyses indicated that there was a linear relationship between AA and the TPC or TFC of DPF. The study demonstrates the potential of Iranian dates as antioxidant functional food ingredients [Biglari Foroogh, AlKarkhi Abbas FM and Essa Azhar Mat, Antioxidant activity and phenolic content of various date palm (_Phoenix dactylifera_) fruits from Iran, _Food Chem_, 2008, 107 (4), 1636-1641].
Effects of a mixture of fatty acids from Sugar cane wax oil in inflammation

A mixture of fatty acids obtained from Sugar cane (*Saccharum officinarum* Linn.) wax oil (FAM), in which the main constituents are palmitic, oleic, linoleic and linolenic acids, was evaluated by the scientists at Ciudad de la Habana, Cuba. The experiment was conducted on two models of inflammation: Zymosan-induced arthritis and in the tail test for psoriasis, both on mice. In the first model, FAM significantly reduced Zymosan-induced increase of β-glucuronidase (DE$_{50}$ 90±7mg/kg). Histopathological studies showed inhibition in cellular infiltration and reduction of synovial hyperplasia and synovitis, whereas in the second test, histopathological and ultrastructural studies showed that topical application of FAM induced orthokeratosis with the presence of keratohyalin granules in the previously parakeratotic adult mouse tail and without effects on epidermal thickness. The ED$_{50}$ of FAM in this model was 155±10mg. Thus, topical application of FAM exerts an anti-inflammatory effect without irritation and this may be due to its inhibitory effects on arachidonic acid metabolism [Ledón N, Casacó A, Remírez D, González A, Cruz J, González R, Capote A, Tolón Z, Rojas E, Rodríguez VJ, Merino N, Rodríguez S, Ancheta O and Cano MC, Effects of a mixture of fatty acids from sugar cane (*Saccharum officinarum* L.) wax oil in two models of inflammation: Zymosan-induced arthritis and mice tail test of psoriasis, *Phytomedicine*, 2007, 14(10), 690-695].

Betanin, a betacyanin pigment from fruits of *Opuntia ficus-indica* (Linn.) Mill. induces apoptosis

Betalains are water-soluble nitrogenous vacuolar pigments present in flowers and fruits of many caryophyllales with potent antioxidant properties. The researchers at School of Life Sciences, University of Hyderabad, Hyderabad, India evaluated the antiproliferative effects of betanin, a principle betacyanin pigment, isolated from the fruits of *Opuntia ficus-indica* (Linn.) Mill. on human chronic myeloid leukemia cell line (K562). The results showed dose and time dependent decrease in the proliferation of K562 cells treated with betanin with an IC$_{50}$ of 40µM. Further studies involving scanning and transmission electron microscopy revealed the apoptotic characteristics such as chromatin condensation, cell shrinkage and membrane blebbing. Agarose electrophoresis of genomic DNA of cells treated with betanin showed fragmentation pattern typical for apoptotic cells. Flow cytometric analysis of cells treated with 40µM betanin showed 28.4% of cells in sub G0/G1 phase. Betanin treatment to the cells also induced the release of cytochrome c into the cytosol, poly (ADP) ribose polymerase (PARP) cleavage, down regulation Bcl-2 and reduction in the membrane potentials. Confocal microscopic studies on the cells treated with betanin suggest the entry of betanin into the cells. These studies thus demonstrated that betanin induces apoptosis in K562 cells through the intrinsic pathway and is mediated by the release of cytochrome c from mitochondria into the cytosol and PARP cleavage. The antiproliferative effects of betanin add further value to the nutritional characteristics of these wild fruits [Sreekanth Devalraju, Arunasree MK, Roy Karnati R, Reddy T Chandramohan, Reddy Gorla V and Reddanna Pallu, Betanin, a betacyanin pigment purified from fruits of *Opuntia ficus-indica* induces apoptosis in human chronic myeloid leukemia Cell line-K562, *Phytomedicine*, 2007, 14(11), 739-746].

Antidiabetic activity of aqueous root extract of *Ichnocarpus frutescens* R. Br. in rats

The researchers at Smriti College of Pharmaceutical Education, Nipania, Indore, India administered aqueous root extract (250 and 500 mg/kg, p.o.) of *Ichnocarpus frutescens* R. Br. or vehicle (gum acacia solution) or standard drug Glibenclamide (0.25 mg/kg) for 15 days in Streptozotocin-nicotinamide induced type-II diabetic rats (n = 6).
Blood samples were collected by retro-orbital puncture and were analyzed for serum glucose on days 0, 5, 10 and 15 by using glucose oxidase-peroxidase reactive strips and a glucometer. For oral glucose tolerance test, glucose (2 g/kg, p.o.) was administered to nondiabetic control rats and the rats treated with Glibenclamide (10 mg/kg, p.o.) and aqueous root extract of *I. frutescens*. The serum glucose levels were analyzed at 0, 30, 60 and 120 min after drug administration. The effect of the extract on the body weight of the diabetic rats was also observed. The aqueous root extract of *I. frutescens* (250 and 500 mg/kg, p.o.) induced significant reduction \((P<0.05)\) of fasting blood glucose levels in Streptozotocin-nicotinamide induced type-II diabetic rats on the 10th and 15th days. In the oral glucose tolerance test, the extract increased the glucose tolerance. It also brought about an increase in the body weight of diabetic rats. Thus, it is concluded that *I. frutescens* has significant antidiabetic activity as it lowers the fasting blood sugar level in diabetic rats and increases the glucose tolerance [Barik Rakesh, Jain Sanjay, Qwatra Deep, Joshi Amit, Tripathi Girraj Sharan and Goyal Ravi, Antidiabetic activity of aqueous root extract of *Ichnocarpus frutescens* in streptozotocin-nicotinamide induced type-II diabetes in rats, *Indian J Pharmacol*, 2008, 40(1), 19-22].

**Anti-asthmatic activity of *Moringa oleifera* Lam. seeds**

The efficacy and safety of seed kernels of *Moringa oleifera Lam.* in the treatment of bronchial asthma was investigated by the researchers at L.M. College of Pharmacy, Ahmedabad, India. Twenty patients of either sex with mild-to-moderate asthma were given finely powdered dried seed kernels in dose of 3 g for 3 weeks. The clinical efficacy with respect to symptoms and respiratory functions were assessed using a spirometer prior to and at the end of the treatment. Hematological parameters were not changed markedly by treatment with *M. oleifera*. However, the majority of patients showed a significant increase in haemoglobin (Hb) values and Erythrocyte sedimentation rate (ESR) was significantly reduced. Significant improvement was also observed in symptom score and severity of asthmatic attacks. Treatment with the drug for 3 weeks produced significant improvement in forced vital capacity, forced expiratory volume in one second and peak expiratory flow rate values by 32.97 ± 6.03, 30.05 ± 8.12 and 32.09 ± 11.75%, respectively, in asthmatic subjects. Improvement was also observed in % predicted values. None of the patients showed any adverse effects with *M. oleifera* [Agrawal Babita and Mehta Anita, Antiasthmatic activity of *Moringa oleifera* Lam: A clinical study, *Indian J Pharmacol*, 2008, 40(1), 28-31].

**Antileishmanial compounds from *Cordia fragrantissima* Kurz collected in Burma (Myanmar)**

Leishmaniasis is a parasitic disease caused by protozoal species of the genus *Leishmania*, of which over 20 are known to be pathogenic to humans. Pentavalent antimonials are currently used for basic treatment of the disease, but these drugs are extremely toxic and generally expensive. Hence, more economical and less toxic drugs seem to be necessary. As part of a search for plant compounds that are active against *Leishmania* spp., it was found that a methanol extract of the wood of *Cordia fragrantissima Kurz.* (Boraginaceae), a plant from Burma (Myanmar), exhibited significant in vitro antileishmanial activity.

The Japanese scientists worked on isolation and structural determination of the active antileishmanial components of this plant and the activity of their derivatives of these naturally occurring compounds. Bioassay-guided fractionation of this extract using several chromatographic techniques afforded three new compounds and five known compounds. The structures of the new compounds were revealed on the basis of spectroscopic data interpretation and by X-ray crystallographic analysis. Interestingly, the new compounds, despite the presence of asymmetric carbons, were found to be racemates. The activities of the isolates from *C. fragrantissima*...
Botanical integrity of wheat products influences the gastric distention and satiety in healthy subjects

Maintenance of the botanical integrity of cereal kernels and the addition of acetic acid (as vinegar) in the product or meal has been shown to lower the postprandial blood glucose and insulin response and to increase satiety. However, the mechanism behind the benefits of acetic acid on blood glucose and satiety is not clear. Therefore, the researchers at University of Lund, Malmö University Hospital, Malmö, Sweden and Lund University Hospital, Lund, Sweden evaluated the possible influence of maintained botanical integrity of cereals and the presence of acetic acid (vinegar) on gastric emptying rate (GER), postprandial blood glucose and satiety. During experiment fifteen healthy subjects were included in a blinded crossover trial and thirteen of the subjects completed the study. Equicarbohydrate amounts of the following wheat-based meals were studied: white wheat bread, whole-kernel wheat bread or wholemeal wheat bread served with white wine vinegar. The results were compared with a reference meal consisting of white wheat bread without vinegar. The GER was measured with standardized real-time ultrasonography using normal fasting blood glucose <6.1 mmol/l or plasma glucose <7.0 mmol/l as an inclusion criterion. The GER was calculated as the percentage change in the antral cross-sectional area 15 and 90 minutes after ingestion of the various meals. Satiety scores were estimated and blood glucose was measured before and 15, 30, 45, 60, 90 and 120 min after the start of the meal.

The whole-kernel wheat bread with vinegar resulted in significantly higher (<0.05) satiety than the wholemeal wheat bread and white wheat bread with vinegar and the reference bread. Wheat fibre present in the wholemeal wheat bread, or the presence of wheat kernels per se, did not affect the postprandial blood glucose or GER significantly compared with white wheat bread, neither did the addition of vinegar to white bread affect these variables. There was no correlation found between the satiety with antral areas or GER. Thus, there is higher satiety after a whole-kernel wheat bread meal with vinegar intake.

Assessment of antidiabetic potential of Cynodon dactylon Pers. extract in Streptozotozin diabetic rats

The researchers at University of Allahabad, Allahabad, India investigated the hypoglycaemic and antidiabetic effect of single and repeated oral administration of the aqueous extract of Cynodon dactylon Pers. in normal and Streptozotozin induced diabetic rats, respectively. The effect of repeated oral administration of aqueous extract on serum lipid profile in diabetic rats was also examined. A range of doses, viz. 250, 500 and 1000mg/kg bw of aqueous extract of C. dactylon were evaluated and the dose of 500mg/kg was identified as the most effective dose. It lowers blood glucose level around 31% after 4 h of administration in normal rats. The same dose of 500mg/kg produced a fall of 23% in blood glucose level within 1h during glucose tolerance test (GTT) of mild diabetic rats. This dose has almost similar effect as that of standard drug Tolbutamide (250mg/kg bw). Severely diabetic rats were also treated daily with 500mg/kg bw for 14 days and a significant reduction of 59% was observed in fasting blood glucose level. A reduction in the urine sugar level and increase in body weight of severe diabetic rats were additional corroborating factors for its antidiabetic potential.
cholesterol, low density lipoprotein and triglyceride levels were decreased by 35, 77 and 29%, respectively, in severely diabetic rats whereas, cardioprotective, high density lipoprotein was increased by 18%. These results clearly indicate that aqueous extract of *C. dactylon* has high antidiabetic potential along with significant hypoglycemic and hypolipidemic effects [Singh Santosh Kumar Kesari, Achyut Narayan, Gupta Rajesh Kumar, Jaiswal Dolly and Watal Geeta, Assessment of antidiabetic potential of *Cynodon dactylon* extract in streptozotocin diabetic rats, *J Ethnopharmacol*, 2007, 114(2), 174-179].

**Evaluation of estrogenic activity of alcoholic extract of rhizomes of Curculigo orchioides Gaertn.**

The rhizomes of *Curculigo orchioides Gaertn.* (Family—Amaryllidaceae) is an important Ayurvedic as well as Unani drug. It is present in several drug formulations used in the treatment of menorrhagia and other gynecological problems. The researchers at N.G.S.M Institution of Pharmaceutical Sciences, Mangalore, Karnataka and Lotus Labs Private Limited, Bangalore, Karnataka, India, conducted a comparative study of estrogenic activity of alcoholic extract of *C. orchioides* with ethynylstrilbestrol in bilaterally ovariectomized young albino rats. Bilaterally ovariectomized albino rats were divided into five groups (*n*=9) receiving different treatments, consisting of vehicle (0.6%w/v sodium carboxy methyl cellulose), ethanolic extract of rhizomes at three different doses (viz. 300, 600 and 1200mg/kg body weight) and standard drug diethylstilbestrol (DES) at a dose of 2mg/kg body weight. All these were administered orally daily for 7 days. Estrogenic activity was assessed by taking percentage vaginal cornification, uterine wet weight, uterine glycogen content and uterine histology as parameters of assessment. Alcoholic extract of the rhizomes showed a significant increase in percentage vaginal cornification, uterine wet weight (*P*<0.001), uterine glycogen content (*P*<0.001) and a proliferative changes in uterine endometrium compared to the control [Vijayanarayana K, Rodrigues Rashmi S, Chandrashekhar KS and Subrahmanyam EVS, Evaluation of estrogenic activity of alcoholic extract of rhizomes of *Curculigo orchioides*, *J Ethnopharmacol*, 2007, 114(2), 241-245].

**Medicinal smoke reduces airborne bacteria**

The researchers at National Botanical Research Institute, CSIR, Lucknow, India and Asian Agri-History Foundation, Secunderabad, India have done a comprehensive analysis and scientific validation of ancient knowledge about the effect of ethnopharmacological aspects of natural products’ smoke for therapy and health care on airborne bacterial composition and dynamics, using the Biolog microplate panels and Microlog database. They observed that one hour treatment of medicinal smoke emanated by burning wood and a mixture of odoriferous and medicinal herbs (*havan sāmagri*=material used in oblation to fire all over India) on aerial bacterial population caused over 94% reduction of bacterial counts by 60 min and the ability of the smoke to purify or disinfect the air and to make the environment cleaner was maintained up to 24 hours in the closed room. Absence of pathogenic bacteria: *Corynebacterium urealyticum*, *Curtobacterium flaccumfaciens*, *Enterobacter aerogenes* (*Klebsiella mobilis*), *Kocuria rosea*, *Pseudomonas syringae* pv. *persicae*, *Staphylococcus lentus* and *Xanthomonas campestris* pv. *tardicrescens* in the open room even after 30 days is indicative of the bactericidal potential of the medicinal smoke treatment. It is demonstrated that using medicinal smoke it is possible to completely eliminate diverse plant and human pathogenic bacteria of the air within confined space [Nautiyal Chandra Shekhar, Chauhan Puneet Singh and Nene Yeshwant Laxman, Medicinal smoke reduces airborne bacteria, *J Ethnopharmacol*, 2007, 114(3), 446-451].
Effect of Almond skin polyphenolics and quercetin on human LDL and apolipoprotein B-100 oxidation and conformation

Almond skin polyphenolics (ASP) and vitamin C (VC) or E (VE) inhibit the Cu^{2+}-induced generation of conjugated dienes in human low-density lipoprotein (LDL) in a synergistic manner. However, the mechanism(s) by which this synergy occurs is unknown. As modification of apolipoprotein (apo) B-100 is an early, critical step in LDL oxidation, the researchers at Tufts University, Boston, USA examined the effects of combining ASP or quercetin and antioxidant vitamins on the oxidation of this moiety as well as on the alteration of LDL conformation and electronegativity (LDL-). In a dose-dependent manner, ASP (0.12-2.0 µmol/l gallic acid equivalents) decreased tryptophan (Trp) oxidation by 6.7-75.7%, increased the generalized polarity (Gp) of LDL by 21.0-81.5% at 90 min and reduced the ratio of LDL- to total LDL (tLDL) by 38.2-83.8% at 5 h. The actions of ASP on these parameters were generally additive to those of VC and VE. However, a 10-25% synergy of ASP plus VC in protecting apo B-100 Trp against oxidation may result from their synergistic interaction in prolonging the lag time to oxidation. ASP and VE acted in synergy to reduce LDL-/tLDL by 24-43%. Quercetin’s actions were similar to ASP, though more effective at inhibiting Trp oxidation. Thus, ASP and quercetin reduce the oxidative modification of apo B-100 and stabilize LDL conformation in a dose-dependent manner, acting in an additive or synergistic fashion with VC and VE [ChenChung-Yen, Milbury Paul E, Chung Shin-Kyo and Blumberg Jeffrey, Effect of almond skin polyphenolics and quercetin on human LDL and apolipoprotein B-100 oxidation and conformation, *J Nutr Biochem*, 2007, 18(12), 785-794].

Antioxidative and radical scavenging effects of Vetch phenolics

The scientists at Poland and USA evaluated the antioxidant and antiradical activity of Vetch, *Vicia sativa Linn.* extract and its fractions. The acetone extract of seeds and fractions, comprising low molecular-weight phenolics and tannins, displayed good antioxidant activity. Thus, the use of vetch extract can be recommended for functional foods preparation as an enriched source of antioxidant compounds in human diet [Amarowicz R, Troszyńska A and Pegg RB, Antioxidative and radical scavenging effects of phenolics from *Vicia sativum*, *Fitoterapia*, 2008, 79 (2), 121-122].

Differential apoptotic induction of gambogic acid, a novel anticancer natural product

Gambogic acid (GA) is the major active ingredient of gamboge, a brownish resin exuded from *Garcinia hanburyi* Hook f. tree in Southeast Asia. Researchers at China Pharmaceutical University, Tongjiaxiang, Nanjing, China and Department of Chemistry and Biochemistry, Florida International University, Miami, FL, USA carried out studies and compared different apoptotic induction of GA on human normal embryo hepatic L02 cells and human hepatoma SMMC-7721 cells by detecting growth inhibition, observing morphological changes and the expressions of the relative apoptotic proteins (Bax, Bcl-2 and caspase-3). The results indicated that GA could selectively induce apoptosis of SMMC-7721 cells, while had relatively less effect on L02 cells. To illustrate the distinct selective antitumour mechanism of GA, they further studied its distribution in cultured cells and in tumour-bearing mice. The retention time of GA in grafted tumour was longer than in liver, renal and other organs. Collectively, the selective anticancer activity of GA could be due to its significant apoptotic inducing effects as well as its higher distribution and longer retention time in tumour cells compared to the normal cells. So GA might be a kind of highly effective anticancer drug with low toxicity to normal tissue [Yang Yong, Yang Lan, You Qi-Dong, Nie Fei-Fei, Gu Hong-Yan, Zhao Li, Wang Xiao-Tang and Guo Qing-Long, Differential apoptotic induction of gambogic acid, a novel anticancer natural product, on hepatoma cells and normal hepatocytes, *Cancer Lett*, 2007, 256 (2), 259-266].
**Hepatoprotective activity of Clerodendrum inerme (Linn.) Gaertn.**

The researchers at Balaji Institute of Pharmaceutical Sciences, Warangal, Andhra Pradesh and Department of Pharmacology, Nandha College of Pharmacy, Erode, Tamil Nadu, India conducted studies and screened ethanolic extract of *Clerodendrum inerme* (Linn.) Gaertn., leaves for its hepatoprotective activity in CCl₄ (0.5ml/kg, i.p) induced liver damage in Swiss albino rats at a dose of 200mg/kg bw. The ethanolic extract significantly (P<0.001) decreases the serum enzyme alanine amino transferase, aspartate amino transferase, alkaline phosphates, triglycerides, total cholesterol and significantly increased the glutathione level. Silymarin (25mg/kg), a known hepatoprotective drug used for comparison exhibited significant activity (P<0.001). The extract did not show any mortality up to a dose of 2000g/kg bw. It is concluded that the ethanolic extract of leaves of this plant seems to possess hepatoprotective activity in rats. No toxic symptom or mortality was observed in 48h of study in mice. These results support the traditional use of this plant in hepatotoxicity [Gopal N and Sengottuvelu S, Hepatoprotective activity of Clerodendrum inerme against CCl₄ induced hepatic injury in rats, *Fitoterapia*, 2008, 79 (1), 24-26].

**Antioxidant and free radical scavenging activities Curry leaf extracts**

The *in vitro* antioxidant properties of different extracts (water, alcohol, alcohol:water, hexane or chloroform extract) of curry leaves [*Murraya koenigii* (Linn.) Spreng.] were evaluated by researchers at Adichunchanagiri Biotechnology and Cancer Research Institute, B.G. Nagara, Karnataka and Jawaharlal Nehru Center for Advanced Scientific Research, Molecular Parasitology and Protein Engineering Laboratory, Jakkur, Bangalore, India using various assays. The alcohol:water (1:1) extract of curry leaves showed the highest antioxidant and free radical scavenging activity. It inhibited membrane lipid peroxidation by 76%, at 50µg/ml, scavenged 93% of superoxides at 200µg/3ml and scavenged approximately 90% of hydroxyl and 1,1-diphenyl-2-picrylhydrazayl radicals at 4-5-fold lower concentrations compared to the other tested extracts. In addition, the alcohol:water extract reduced cytochrome c and ferric ion levels, chelated ferrous ions and inhibited ferrous sulfate:ascorbate-induced fragmentation and sugar oxidation of DNA. These results establish the antioxidant potential of this plant [Ningappa Mylarappa B, Dinesha Ramadas and Srinivas Leela, Antioxidant and free radical scavenging activities of polyphenol-enriched curry leaf (*Murraya koenigii* L.) extracts, *Food Chem*, 2008, 106 (2), 720-728].

**Anti-plasmodial activity of Ailanthus excelsa Roxb.**

The anti-plasmodial activity of *Ailanthus excelsa* stem bark was investigated by researchers at Department of Pharmacological Sciences and Department of Public Health, Microbiology and Virology, University of Milan, Milan, Italy and National Research Centre, Pharmacognosy Department, Dokki, Giza, Egypt. The methanolic extract inhibited in vitro growth of chloroquine-sensitive (D10) and resistant strains (W2) of *Plasmodium falciparum* (IC₅₀ 4.6 and 2.8 µg/ml, respectively). The effect was retained in the chloroform fraction (3.1 and 2.1 µg/ml, respectively). The anti-plasmodial activity could be ascribed to the impairment of haemoglobin degradation through the inhibition of plasmepsin II activity (IC50 of 13.43 ± 1.74 µg/ml) and of the haem detoxification to haemozoin [Dell’Agli Mario, Galli Germana V, Parapini Silvia, Basilico Nicoletta, Taramelli Donatella, Said Ataa, Rashed Khaled and Bosisio Enrica, Anti-plasmodial activity of Ailanthus excelsa, *Fitoterapia*, 2008, 79 (2), 112-116].

**Therapeutics**