



Coriander —A potential household herbal remedy for hyperlipidemia

The importance of herbal hypolipidemics has increased to fill the lacunae created by allopathic medicines. Coriander is a spice, which is used in daily cooking especially in India. In Ayurvedic literature it is reported to possess hypolipidemic activity. Hence, to validate these ancient known property researchers at International Institute of Biotechnology and Toxicology, Padappai, Tamil Nadu carried out hypolipidemic effect of seed powder of coriander, *Coriandrum sativum* Linn. in triton-induced hyperlipidemic rats.

In the biphasic model of triton-induced hyperlipidemia, coriander at a dose of 1g/kg body weight reduced



cholesterol and triglycerides levels in both synthesis and excretory phases in rats, and the results were comparable with that of Liponil, a commercially available herbal hypolipidemic drug. Coriander also decreases the uptake and enhances the breakdown of lipids. From the study it can be assumed that coriander has the potential to be popularized as a household herbal remedy with preventive and curative effect against hyperlipidemia [Sam Lal *et al*, *Indian J Exp Biol*, 2004, 42(9), 909-912].



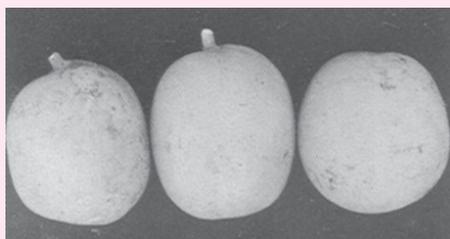
Anti-inflammatory, antipyretic and analgesic properties of Bael leaves

The leaves of *Aegle marmelos* Corr. (Hindi—*Bael*) are used in traditional practices as analgesic, antipyretic and anti-inflammatory. Hence, pharmacologists at Tamil Nadu, India and Japan investigated the antinociceptive,

anti-inflammatory and antipyretic effects of the various serial extracts of the leaves of *A. marmelos* in experimental animals.

The results showed that most of the extracts caused a significant inhibition of the carrageenan-induced paw oedema and cotton-pellet granuloma in rats. The extracts also produced marked analgesic activity by reduction in the early and late phases of paw licking in mice. A significant reduction in hyperpyrexia in rats was also produced by the most of the extracts. In

addition, all the extracts showed antipyretic activity in mice, made hyperthermic by dried yeast injection. The response of chloroform, diethyl ether and methanol extracts was almost comparable to that of Paracetamol. However, active principles responsible for the above mentioned pharmacological actions also remain to be identified [Arul *et al*, *J Ethnopharmacol*, 2005, 96(1-2), 159-163].





Therapeutics



Antimicrobial activity of Chrysanthemum oil

Chrysanthemum indicum Linn. (Hindi – *Guldaudi*) is a well-known herb with small yellow flowers. The aerial parts (stems, leaves and flowers) are used to treat vertigo, hypertensive symptoms and several infectious diseases such as pneumonia, colitis, stomatitis, carbuncle and fever. Its flowers are also commonly used as tea to treat some eye diseases in Chinese traditional medicine. Antibacterial activity of its oil has also been confirmed against *Staphylococcus aureus*, *Escherichia coli* and *Streptococcus pneumoniae*. Scientists at College of Life Sciences, Wuhan University, Wuhan PR China evaluated chemical composition and antimicrobial activity of its essential oils.

During experiment three essential oils from three samples: fresh, air-dried and processed flowers were obtained by hydrodistillation and analyzed by GC-MS. The results show that major constituents of the three oils were 1,8-

cineole, camphor, borneol and bornyl acetate, but the percentage of these compounds varied greatly because of the processing of flowers. The antimicrobial activity of essential oils from air-dried and processed flowers was tested against 15 microorganisms including three yeasts and seven clinical isolated strains using disc paper and broth microdilution methods. The results show that both essential oils possessed significant



antimicrobial effect, however, some difference in antimicrobial activity between two oils was observed for several microorganisms, which was attributed to the variation in percentage of the components. With higher percentage of camphor, the oil of the processed flowers exhibited, in many cases, greater bacteriostatic activity than that of the air-dried ones.

Thus, the antimicrobial assays justified and supported partly the popular usage of the flowers as traditional remedies for some infections. It was of interest to note that the strong antimicrobial activity of the oils against clinical isolated microorganisms, especially *Staphylococcus saprophyticus* and *E. coli* suggested that the essential oils could be new medicinal resource for antibacterial agents [Shunying *et al*, *J Ethnopharmacol*, 2005, **96**(1-2), 151-158].

Hypotensive effect of Butein derived from Lacquer tree

Butein, a plant polyphenol, is one of the active components of stems of Lacquer tree (*Rhus verniciflua* Stokes) have been traditionally used for treatment of pain, parasites, and thrombotic disease in Korea. Kang and others investigated the hypotensive effect of butein and its possible mechanism, especially inhibitory effect of an angiotension converting enzyme (ACE).

The screening and development of ACE inhibitor would be beneficial in the treatment of cardiovascular diseases. Intravenous injection of butein lowered the arterial blood pressure of anesthetized rats in a dose-dependent manner. The plasma ACE activities were significantly inhibited by the addition of butein in a dose-dependent manner, the IC_{50} value of which was 198 $\mu\text{g/ml}$ (730 μM).

Moreover, angiotensin I-induced contraction was markedly attenuated by prior exposure of endothelium-intact aortic rings to butein, but angiotensin II-induced contraction was not altered. These results suggest that butein has a hypotensive effect, at least in part, *via* the inhibition of angiotensin converting enzyme [Kang *et al*, *Biol Pharm Bull*, 2003, **26** (9), 1345-1347].





Therapeutics

Effect of chronic administration of *Stevia* leaves extract on fertility in rats

Stevia rebaudiana (Bert.) Bertoni leaves have been used as powerful sweetening agents (as stevioside). Physiological and pharmacological experiments have suggested that stevioside and its extracts promote effects on some physiological systems, such as cardiovascular and renal. In addition, stevioside and *Stevia* extracts are able to induce diuresis, natriuresis and kaliuresis. The hypoglycaemic effect reported by some authors has been observed exclusively with total extracts and not with purified stevioside. In an experiment female rats and mice fed with a 5% aqueous extract displayed reduced

fertility, an effect apparently not reversible following drug withdrawal.

Dr Melis at Brazil evaluated the effects of chronic administration of *Stevia* on fertility in rats and to examine the possibility that its extract may induce changes (i) in male accessory sex glands and (ii) in androgenic levels in rats. During experiment crude aqueous extract of leaves; 3.8 kg were evaporated under reduced pressure and at 30-50°C to yield 1 kg of dry, concentrated extract. Twenty male Wistar rats (25-30 days old) were used as experimental animals.

The study showed that chronic administration (60 days) of a aqueous

extract of leaves produced a decrease in final weight of testis, seminal vesicle and cauda epididymidis. In addition, the fructose content of the accessory sex glands and the epididymal sperm concentration are decreased. *Stevia* treatment tended to decrease the plasma testosterone level, probably by a putative affinity of glycosides of extract for a certain androgen receptor and no alteration occurred in luteinizing hormone level. These data are consistent with the possibility that *Stevia* extracts may decrease the fertility of male rats [Melis, *J Ethnopharmacol*, 1999, **67**(2), 157-161].

Comparison of Saffron and Imipramine in the treatment of mild to moderate depression

Depression is reported to be main cause for many health problems. Depression currently ranks fourth among the major causes of disability worldwide, after lower respiratory infections, prenatal conditions and HIV/AIDS. Saffron (*Crocus sativus* Linn.) is used to treat depression. Hence, scientists at Tehran University of Medical Sciences, Tehran, Iran did a 6-week pilot double-blind randomized trial on the efficacy of stigmas of saffron with Imipramine in the treatment of mild to moderate depression.

Thirty adult outpatients who met the Diagnostic and Statistical Manual of Mental Disorders, 4th edition for major

depression based on the structured clinical interview for DSM IV participated in the trial. Patients have a baseline Hamilton Rating Scale for Depression score of at least 18. In this double-blind, single-center trial, patients were randomly



assigned to receive capsule of saffron 30 mg/day (TDS) (Group 1) and capsule of Imipramine 100 mg/day (TDS) (Group 2) for a 6-week study.

Saffron at this dose was found to be effective similar to Imipramine in the treatment of mild to moderate depression ($F = 2.91$, d.f. = 1, $P = 0.09$). In the Imipramine group anticholinergic effects such as dry mouth and also sedation were observed more often that was predictable. Thus, the study revealed that saffron may be of therapeutic benefit in the treatment of mild to moderate depression (Akhondzadeh *et al*, *BMC Complement Altern Med*, 2004, **4**,12).





Probiotics effective for Ulcerative Colitis

Inflammatory bowel disease (IBD) includes a number of chronic, relapsing inflammatory disorders involving the gastrointestinal tract. It is estimated that more than 600,000 people in the United States have some form of inflammatory bowel disease. Classically, inflammatory bowel disease includes ulcerative colitis and Crohn's disease. In ulcerative colitis (UC) inflammation occurred throughout the entire colon. Research increasingly suggests that the inflammation associated with UC and IBD is related to an overabundance of "bad" bacteria and a deficiency of "good bacteria" known as Probiotics. It has been found probiotics act just as well as

prescription drugs in helping relapses in UC. Researchers studied 327 IBD patients, with 162 receiving 200 mg *Escherichia coli* Nissle once daily while 165 received 500 mg Mesalazine, a prescription drug regarded as the gold standard for treating IBD, three times daily for one year. Patients were regularly assessed for signs of relapse using the Rachmilewitz clinical and endoscopic activity indices, and according to histology at the end of the study. Compared to the relapses of patients on Mesalazine (38/112 = 33.9 per cent), the probiotic group had a similar percentage of relapse (40/110 = 36.4 per cent). The probiotic drug *E. coli* Nissle 1917 shows efficacy and safety in

maintaining remission equivalent to the gold standard Mesalazine in patients with UC and that these results re-emphasize the pathogenetic significance of the enteric flora. Although both groups tolerated their treatment well with no reported adverse side effects, a note of caution should be raised about Mesalazine, since it has been the subject of research regarding dangerous side effects that include pancreas and kidney damage, making probiotics all the more reasonable as an effective option for UC [*Herbal Remedies Natural Health Newsletter*, December 2004, Issue 239].

Sandoricum koetjape bark — A chemopreventive agent

Red or Yellow Sentol, *Sandoricum koetjape* (Burm.f.) Merrill syn. *S. indicum* Cav. (Family—*Meliaceae*) is a large tree species that grows in India, Malaysia and other tropical countries in Asia. Its bark is used as a folk medicine for treating colic and leucorrhoea. A hexane extract prepared from the bark was found to show remarkable ichthyotoxic activity. Bioassay-guided fractionation of the hexane extract led to the isolation of three triterpenoids. In the hope of exploring their function as chemoprevention agents in chemical carcinogenesis, Ismail and others evaluated their *in vitro* and *in vivo* anti-tumour-

promoting effects in Japan. Of the triterpenoids active *in vitro*, koetjapic acid appears to be a promising cancer



chemopreventive agent, since it significantly delayed tumour promotion in two-stage mouse skin carcinogenesis induced by 7,12-dimethylbenze (a) anthracene and promoted by 12-O-tetradecanoylphorbol 13-acetate (TPA). Koetjapic acid was found more effective than glycyrrhetic acid and anti-tumour promoter reported from the Chinese drug licorice. Although the anti-tumour promoting mechanism of koetjapic acid is not yet clear, *S. koetjape* bark should be further studied as a source for possible cancer chemopreventive agents [Ismail *et al*, *Biol Pharm Bull*, 2003, 26(9), 1351-1353].





Therapeutics

Grapefruit oil as potential novel efflux pump modulators

The constant use of antibiotics in the hospital environment has selected bacterial populations that are resistant to many antibiotics. In particular, many strains of *Staphylococcus aureus* are developing increasing resistance to available antibacterial agents (methicillin-resistant *S. aureus*, MRSA) producing a serious problem in medical microbiology. Efflux pumps are widely involved in antibiotic resistance. Such modulators can be used to enhance the activity of antibacterial agents whose clinical efficacy has been limited by the increasing prevalence of resistant strains. An example is the NorA membrane-associated multidrug efflux protein, which can decrease susceptibility to fluoroquinolones in *S. aureus*.

Grapefruit oil (GFO) is a complex mixture of chemicals extracted from the peel of grapefruit (*Citrus paradisi* Mack.) with one of its major constituents being the monoterpene hydrocarbon,

limonene. GFO contains some of the grapefruit juice (GFJ) components concentrated thousands of times and, owing to its strong fruity fragrance, GFO is often added as a flavour enhancer during commercial preparation of GFJ concentrate. The significance of furanocoumarins present in GFO on CYP3A4 inhibition has recently been reported. Researchers working at Welsh School of Pharmacy, Cardiff University, UK carried out studies to evaluate the susceptibility of MSSA and MRSA strains to antibacterial agents in the presence of GFO isolates and to determine both intrinsic antibacterial activity and modulating effect of the GFO components.

Methicillin-resistant *Staphylococcus aureus* (MRSA) and MSSA strains were treated with: (a) grapefruit oil (GFO) components, isolated by chromatography and characterised by NMR and mass spectroscopy; (b) antimicrobial agents, or (c) a

combination of both to evaluate (MIC determination) intrinsic antibacterial activity and to determine whether GFO components could modulate bacterial sensitivity to the anti-bacterial agents. Preliminary data suggested that the grapefruit component bergamottin epoxide enhances the susceptibility of test MRSA strains to agents e.g. ethidium bromide and Norfloxacin, to which these microorganisms are normally resistant. The GFO components identified and synthesized in this present report, namely the bergamottin and coumarin epoxides, have also been characterized by their ability to maintain and restore the intracellular accumulation of P-gp substrates within MDR positive cell lines. Therefore, they potentially have a broad application for the enhancement of therapeutic agents used for both bacterial infections and MDR solid tumours [Abulrob *et al*, *Phytochemistry*, 2004, **65** (22), 3021-3027].

Antimalarial activity of sesquiterpene lactones isolated from Chicory roots

In Afghanistan aqueous root extracts of Chicory, *Cichorium intybus* Linn. (Hindi — *Kasni*) is used in traditional medicine for malaria treatment. Therefore, Scientists at USA evaluated antimalarial activity of lactucin and lactucopicrin (sesquiterpene lactones) isolated from aqueous root extract of the

plant. Preparative isolation and bioassay against HB3 clone of strain *Honduras-1* of *Plasmodium falciparum* has identified lactucin and lactucopicrin to be antimalarial compounds.

The study conclude that these compounds present in the fresh aqueous

extract would display varying degrees of antimalarial activity and that the collective activity may provide an inexpensive, readily available alternative or adjunct therapy to the scourge [Bischoff *et al*, *J Ethnopharmacol*, 2004, **95**(2-3), 455-457].



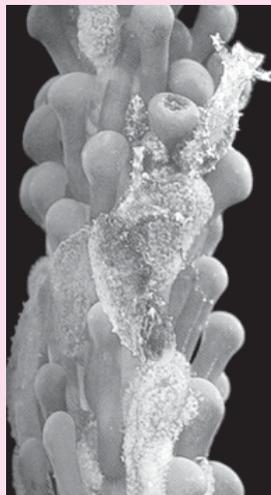


Therapeutics

Anti-herpetic activity of *Caulerpa racemosa*

In recent years, screening assays of the antiviral activity of extracts from a number of marine algae and cyanobacteria has led to the identification of a number of carbohydrate polymers with potent inhibitory effects against several animal viruses, including important human pathogenic agents. These polysaccharides include carrageenans, fucans, mannans, rhamnan sulfates, and sulfated galactans. Thus, the antiviral potential of sulfated polysaccharides extracted from algae is of considerable interest.

Ghosh and others isolated polysaccharide fractions of green alga, *Caulerpa racemosa* (Forsk.) Bosse and investigated their chemical nature and



strains and TK (Thymidine kinase) acyclovir-resistant strains of HSV-1 and HSV-2 of hot water extracted polysaccharide fractions from

antiviral activity against herpes simplex virus type 1 (HSV-1) and type 2 (HSV-2). They described, for the first time, the antiviral activity against reference

C. racemosa. HSV-1 and HSV-2 are responsible for a wide range of human diseases, particularly seriously in immunocompromised individuals. Prolonged therapies with acyclovir in this kind of patients have resulted in some undesirable complications and also induced the emergence of drug-resistant virus. Therefore, there is a real need for new compounds directed to a different target in the viral replicative cycle. To this end, the polysaccharide from *C. racemosa* may represent an interesting alternative to be considered against herpes virus infections [Ghosh *et al*, *Phytochemistry*, 2004, **65**(23), 3151-3157].

Tissue culture

Luffa sponge – A unique matrix for tissue culture of *Philodendron*

Luffa sponge, derived from dried fruits of *Luffa aegyptiaca* Mill. (Sponge gourd, Hindi – *Ghiya tori*), could be a suitable matrix for tissue culture in aseptic liquid culture media. To test this, the response of aroid *Philodendron* 'Xanadu' Hort., an exquisite indoor-ornamental with its beautiful leaves and tangled aerial roots, was studied *in vitro* by Gangopadhyay and others. A study on *in vitro* root development in conventional agar-gelled media in comparison to liquid media with two alternative matrices like *Luffa*

sponge and coir indicated the suitability of *Luffa* sponge over the others. The clonal uniformity of the micropropagated plant was thus substantiated through



Luffa sponge

uniformity in RAPD (Random Amplified Polymorphic DNA) profiles. For commercial mass propagation where cost-effectiveness is a major check point, the technique of RAPD being relatively cheaper than other molecular techniques, will definitely encourage scientists to adopt it worldwide for quality assurance of the tissue culture clones. The plants cultured in liquid medium with *Luffa* sponge as the matrix showed high rate of survival after transplantation, thus economizing the whole endeavour [Gangopadhyay *et al*, *Curr Sci*, 2004, **86**(2), 315-319].

