Oral ingestion of *Ginkgo biloba* extract (EGb 761) may reduce malondialdehyde levels in Type 2 diabetics

*Ginkgo biloba* Linn. extract, clinically referred to as EGb 761, is a very popular over-the-counter herbal dietary supplement in the United States. It is ingested primarily to enhance mental focus mainly because of its purported reports of being able to delay the onset of the loss of cognitive function and improve cognitive function in Alzheimer's disease and senile dementia. A standardized EGb 761: (50:1) contains on average, 24% flavone glycosides and 6% terpene lactones and much of the herb’s effect on cognition has been attributed to the antioxidant and free radical scavenging properties of the flavonoid fraction.

Recently it has been reported that ingestion of *Ginkgo biloba* extract (EGb 761): (a) significantly reduced collagen-induced platelet aggregation and thromboxane B₂ (TXB₂) production in both non-diabetic individuals as well as those with Type 2 diabetes mellitus (T2DM), (b) significantly reduced platelet malondialdehyde (MDA), an index of lipid peroxidation, in non-diabetic subjects. In a study conducted by researchers of USA revealed that ingestion of EGb 761 (120mg daily for 3 months), significantly decreased platelet MDA-thiobarbituric acid reacting substances (TBARS) (41 ± 9pmol/10⁷ platelets versus 30 ± 11pmol/10⁷ platelets) (P< 0.005) in T2DM subjects with normal cholesterol levels (total cholesterol, 164 ± 22mg/dl; age, 54 ± 9 years; BMI, 35.0 ± 8.8kg/m², n = 12). In T2DM subjects with high cholesterol (total cholesterol, 218 ± 15mg/dl; age, 52 ± 5 years; BMI, 36.2 ± 6.6kg/m², n = 7), EGb 761 ingestion reduced the platelet TBARS from 29 ± 9 to 22 ± 9pmol/10⁷ platelets (P< 0.04). Because ingestion of EGb 761 did not alter platelet counts it is concluded that EGb 761, probably due to the flavonoid fraction, reduced the TBARS by inhibiting cyclooxygenase (COX)-1-mediated arachidonic acid oxygenation or by reducing the arachidonic acid pool. This is likely to lead to a reduction of platelet hyperactivity, a significant contributor to the development of cardiovascular disease in T2DM patients. Because of other reported beneficial properties of EGb 761, such as stimulation of pancreatic β-cell function in T2DM subjects with pancreatic exhaustion, it appears that T2DM subjects might benefit from ingesting EGb 761 as a dietary supplement [Kudolo George B, Delaney Diana and Blodgett Janet, Short-term oral ingestion of *Ginkgo biloba* extract (EGb 761) reduces malondialdehyde levels in washed platelets of type 2 diabetic subjects, *Diabetes Res Clin Pract*, 2005, 68 (1), 29-38].

Bifidogenic effect of *Taraxacum officinale* root

Bifidobacteria constitute a major part of the human intestinal microflora and have proved considerable health promoting benefits to the host. Bifidobacteria growth and activity in the large intestine can be supported by fructooligosaccharides and inulin of chicory and Jerusalem artichoke origins.

Researchers at Department of Microbiology, Nutrition and Dietetics and Institute of Tropics and Subtropics, Czech University of Agriculture Prague, Prague 6 Suchdol, Czech Republic carried out investigations on Dandelion root to study its bifidogenic effects. The infusion of Dandelion root (*Taraxacum officinale* Weber ex Wiggers, Hindi — *Dulal, Kanphul*) stimulated *in vitro* the growth of 14 strains of bifidobacteria. The utilization of oligofructans, glucose, fructose and total saccharides was determined by enzymatic and phenol-sulfuric methods. Dandelion oligofructans were important source of carbon and energy for bifidobacteria tested. Dandelion root infusion also contains high quantity of nondigestible oligofructans, which are utilizable by bifidobacteria. However, the prebiotic effect of Dandelion root extract need to be tested in *in vivo* conditions [Trojanová I, Rada V, Kokoška I and Vlková E, The bifidogenic effect of *Taraxacum officinale* root, *Fitoterapia*, 2004, 75 (7-8), 760-763].
Growth inhibition of leukemia cells by lipid extracts of marine alga

Interest in seaweed lipids has been on rise owing to the recognition of important bioactive molecules like conjugated fatty acids, pigments (especially fucoxanthin), that have profound physiological effects in the treatment of tumours and other cancer related problems. The scientists at Central Food Technological Research Institute, Mysore, India and Graduate School of Fisheries Science, Hokkaido University, Hakodate, Japan investigated the fatty acid composition of total lipids and different lipid classes of brown seaweed *Sargassum marginatum* harvested off Goa. An effort was made to screen the growth inhibitory/cytotoxic activity of lipid extracts on the human pro-melocytic leukemia (HL-60) cells. Phospholipids (PL) were found to be the most effective compared to the other lipid classes in terms of cytotoxic activity. PL exhibited cytotoxic activity at concentrations as low as 20 \( \mu \)g/ml. Phospholipids were found to be higher in poly unsaturated fatty acids (PUFA) among all the lipid classes analysed. This study indicates the possibility of seaweeds as potential sources of anticancer substances. Further works are needed to identify the active compound responsible for this anticancerous activity [Bhaskar N, Hosakawa M and Miyashita K, Growth inhibition of human pro-myelocytic leukemia (HL-60) cells by lipid extracts of marine alga *Sargassum marginatum* (Fucales, Phaeophyta) harvested off Goa (west coast of India) with special reference to fatty acid composition, *Indian J Mar Sci*, 2004, 33(4), 355-360].

Nobiletin, a citrus flavonoid may prevent atherosclerosis

Flavonoids are a class of chemically related polyphenols that are nearly ubiquitous in nature and that also exhibit a broad spectrum of pharmacological properties. Of the more than 4000 flavonoids thus identified, citrus fruit-derived flavonoids are suggested to have an inverse association with the occurrence of coronary heart disease via their ability to reduce plasma cholesterol concentrations. Current studies conducted in USA examined whether citrus flavonoids possess an additional antiatherogenic effect by modulating macrophage metabolism of the specific class A scavenger receptor (SR-A) ligand, acetylated LDL (acLDL). In this study, both acLDL-metabolism and SR-A expression by cultured murine J774A.1 macrophages was examined following 24hours pretreatment (100\( \mu \)M) with the flavonoids: naringenin (from grapefruit), hesperetin (from oranges), and tangeretin and nobiletin [from tangerines sweet orange peel (*Citrus sinensis* (Linn.) Osbeck] and in bitter orange peel (*Citrus aurantium* Linn.)]. Of these flavonoids, only nobiletin inhibited (50-72%) acLDL-metabolism as measured by both cellular cholesterol ester mass and \[^3\H\]oleate incorporation into cholesterol esters. This nobiletin-mediated effect was specific for SR-A and not a global effect on lipoprotein metabolism by the macrophage, as all four citrus flavonoids significantly reduce the metabolism of beta-VLDL, which is primarily taken up by macrophages via the LDL receptor. Nevertheless, nobiletin did not affect SR-A protein expression, as measured by Western blot analysis, nor was cell surface expression of SR-A affected as measured by 4\(^{\circ}\)C binding studies using \[^{125}\text{I}\]acLDL.

In conclusion, present data suggest that nobiletin, a biologically active flavonoid from citrus fruit, reduces acLDL-mediated accumulation of cholesterol esters in cultured macrophages via a mechanism that is specific for this flavone and is not related to the inhibition of SR-A protein expression or expression of this receptor on the cell surface. This observation, if confirmed in vivo, might have important clinical implications in the prevention and treatment of atherosclerosis. Further studies, as alluded to above, are also needed to better understand nobiletin’s action in macrophages [Whitman Stewart C, Kurowska Elzbieta M, Manthey John A and Daugherty Alan, Nobiletin, a citrus flavonoid isolated from tangerines, selectively inhibits class A scavenger receptor-mediated metabolism of acetylated LDL by mouse macrophages, *Atherosclerosis*, 2005, 178 (1), 25-32].

Therapeutics
Anti-inflammatory, antipyretic and analgesic properties of Bael leaves

*Aegle marmelos* Corr. (Hindi — *Bael*) leaves are used for several diseases in Ayurvedic and Unani system of medicine hence to evaluate analgesic, antipyretic and anti-inflammatory activities experimental studies were done by the scientists of University of Madras, Chennai, India and National Institute of Animal Health, Science City, Japan. The extracts of the leaves showed 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 derived from the leaves 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. Thus, this study has confirmed the traditional claims [Veerappan Arul, Shigeru Miyazaki and Renganathan Dhananjayan, *Studies on the anti-inflammatory, antipyretic and analgesic properties of the leaves of* Aegle marmelos *Corr.*, *J Ethnopharmacol*, 2005, 96(1-2), 159-165].

Hypolipidemic effect of Caper Bush fruit extract in normal and diabetic rats

In the South-eastern region of Morocco (Tafilalet), Caper Bush, *Capparis spinosa* Linn. (Hindi — *Kabra*) fruits are recognized as potent hypoglycaemic agents by several traditional healers. Hence, the scientists at Morocco and France conducted a study in order to evaluate the beneficial effects of the oral administration of the aqueous extract of these fruits, which are the most commonly found in the Moroccan kitchen and used as medicinal plant for the treatment of diabetes mellitus, on plasma lipid parameters in normal and Streptozotocin (STZ) diabetic rats.

The effect of single and repeated oral administrations of the aqueous extract of fruits (CS) at a dose of 20 mg/kg on lipid metabolism in normal and Streptozotocin-induced diabetic rats was studied. In normal rats, the aqueous extract of fruits induced a significant decrease on plasma triglycerides concentrations 1 week (*P* < 0.05) and 2 weeks (*P* < 0.01) after once daily repeated oral administration. A significant decrease of plasma cholesterol levels was also observed 4 days (*P* < 0.05) and 1 week (*P* < 0.05) after repeated oral administration. In diabetic rats, this treatment caused a significant decrease of plasma triglycerides levels after repeated oral administration. Four days after repeated oral administration of aqueous extract, the plasma cholesterol levels were significantly decreased (*P* < 0.05) and still dropped after 2 weeks (*P* < 0.01). On the other hand, the repeated oral administration of aqueous extract caused a significant decrease of body weight 4 days after repeated oral treatment in diabetic rats (*P* < 0.05). Thus, the aqueous extract (20 mg/kg) exhibits a potent lipid lowering activity in both normal and severe hyperglycaemic rats after repeated oral administration of aqueous extract [Eddouks M, Lemhadri A and Michel JB, *Hypolipidemic activity of aqueous extract of Capparis spinosa L in normal and diabetic rats*, *J Ethnopharmacol*, 2005, 98(3), 345-350].

Effect of glycyrrhizin on replication of SARS-associated coronavirus

The outbreak of SARS warrants the search for antiviral compounds to treat the disease. At present, no specific treatment has been identified for SARS-associated coronavirus infection. The researchers at Frankfurt University Medical School, Frankfurt, Germany assessed the antiviral potential of ribavirin, 6-azauridine, pyrazofurin, mycophenolic acid and glycyrrhizin against two clinical isolates of coronavirus (FFM-1 and FFM-2) from patients with SARS admitted to the clinical centre of Frankfurt University, Germany. Of all the compounds, glycyrrhizin was the most active in inhibiting replication of the SARS-associated virus. These findings suggest that glycyrrhizin should be assessed for treatment of SARS [Lancet, 2003, 361(9374), 2045-2046].
Wild chamomile mouthwashes for oral mucositis

The dried flower heads of the plant Chamomile, *Matricaria chamomilla* Linn., have been used in traditional and herbal medicine for centuries because of its anti-inflammatory, spasmolytic, antipeptic, sedative, antibacterial and antifungal properties. Oral mucositis is a known complication of Methotrexate (MTX), a broad-spectrum anti-cancer agent, used to treat a number of autoimmune diseases, including rheumatoid arthritis, but a single efficacious intervention or agent for prophylaxis or management of this side effect has not yet been identified. The researchers at Department of Internal Medicine, University General Hospital of Heraklion Crete, Heraklion, Crete, Greece induced oral mucositis in a patient with rheumatoid arthritis, and successfully treated with Wild chamomile mouthwashes [Mazokopakis EE, Vrentzos GE, Papadakis JA, Babalis DE and Ganotakis ES, Wild chamomile (*Matricaria recutita* L.) mouthwashes in methotrexate-induced oral mucositis, *Phytomedicine*, 2005, 12 (1-2), 25-27].

Neutralization potential Russellíís viper venom by Indian Acalypha

A small annual shrub called Indian Acalypha, *Acalypha indica* Linn., generally occurs as a troublesome weed in gardens, road sides and throughout the plains of India, is used as an antidote for snakebite in Northern India and Andhra Pradesh. The scientists at Department of Pharmacognosy, College of Pharmaceutical Sciences, Manipal, Karnataka, India studied the Viper *russelli russelli* venom neutralization potential of ethanol leaf extract of this weed (250, 500 and 750 mg/kg). Administration of the ethanol leaf extract at i.p. dose levels of 500 and 750 mg/kg significantly inhibited, in a dose dependent manner, the Viper *russelli* venom-induced lethality, haemorrhage, necrotizing and mast cell degranulation in rats and the cardiotoxic and neurotoxic effects in isolated frog tissue. Administration of the extract also significantly inhibited venom-induced lipid peroxidation in RBC, decreased GSH and catalase levels of rat kidney tissue. The observations confirmed that the ethanol leaf extract of the weed possesses potent snake venom neutralizing properties [Shirwaikar Annie, Rajendran K, Bodla Ramgopal and Dinesh Kumar C, Neutralization potential of Viper *russelli russelli* (Russell’s viper) venom by ethanol leaf extract of *Acalypha indica*, *J Ethnopharmacol*, 2004, 94(2-3), 267-273].

Antimicrobial activity of False Sandalwood

*Ximenia americana* Linn., commonly known as False Sandalwood (Family — *Olacaceae*) is a plant that is used in traditional medicine for the treatment of malaria, lepromatous ulcers and skin infections of mixed origin in Northern parts of Nigeria. To evaluate the scientific basis for the use of the plant, researchers at Department of Pharmaceutical and Medicinal Chemistry, Faculty of Pharmacy, Olabisi Onabanjo University, Sagamu, Nigeria, studied the antimicrobial activities of extract of the leaves against six common bacterial isolates. Chemical constituents of the extract were also determined. The extract was active against the test organisms including *Escherichia coli*, *Pseudomonas aeruginosa* and *Candida albicans*. Tannins, flavonoids, alkaloids, saponins, anthrax-quinones, starch, general glycosides and bitter principles were found to be present in the extract [Ogunleye DS and Ibitoye SF, Studies of antimicrobial activity and chemical constituents of *Ximenia americana*, *Tropical J Pharm Res*, 2003, 2(2), 239-241].