Alfafa - Medicago Sativum

Princípio Ativo: rica em vitamina K, contém fitoestrógenos

Uso Popular:

- melhora do apetite, alterações intestinais, usada no tratamento da úlcera péptica;
- alterações urinárias, cistite crônica, elimina retenção hídrica;
- reumatismo e artrite;
- afecções nervosas.

Uso Cientificamente Comprovados ou em Estudos

- Tratamento do diabetes (1)

Biblioteca

Swanston-Flatt SK, Day C, Bailey CJ, Flatt PR.
Biomedical Sciences Research Centre, University of Ulster, Coleraine, UK.

The effects on glucose homeostasis of eleven plants used as traditional treatments for diabetes mellitus were evaluated in normal and streptozotocin diabetic mice. Dried leaves of agrimony (Agrimonia eupatoria), alfalfa (Medicago sativa), blackberry (Rubus fructicosus), celandine (Chelidonium majus), eucalyptus (Eucalyptus globulus), lady's mantle (Alchemilla vulgaris), and lily of the valley (Convallaria majalis); seeds of coriander (Coriandrum sativum); dried berries of juniper (Juniperus communis); bulbs of garlic (Allium sativum) and roots of liquorice (Glycyrrhiza glabra) were studied. Each plant material was supplied in the diet (6.25% by weight) and some plants were additionally supplied as decoctions or infusions (1 g/400 ml) in place of drinking water to coincide with the traditional method of preparation. Food and fluid intake, body weight gain, plasma glucose and insulin concentrations in normal mice were not altered by 12 days of treatment with any of the plants. After administration of streptozotocin (200 mg/kg i.p.) on day 12 the development of hyperphagia, polydipsia, body weight loss, hyperglycaemia and hypoinsulinaemia were not affected by blackberry, celandine, lady's mantle or lily of the valley. Garlic and liquorice reduced the hyperphagia and polydipsia but did not significantly alter the hyperglycaemia or hypoinsulinaemia. Treatment with agrimony, alfalfa, coriander, eucalyptus and juniper reduced the level of hyperglycaemia during the development of streptozotocin diabetes. This was associated with reduced polydipsia (except coriander) and a reduced rate of body weight loss (except agrimony). Alfalfa initially countered the hypoinsulinaemic effect of streptozotocin, but the other treatments did not affect the fall in plasma insulin. The results suggest that certain traditional plant treatments for diabetes, namely agrimony, alfalfa, coriander, eucalyptus and juniper, can retard the development of streptozotocin diabetes in mice.

2- Effects of neem flowers, Thai and Chinese bitter gourd fruits and sweet basil leaves on hepatic monooxygenases and glutathione S-transferase activities, and in vitro metabolic activation of chemical carcinogens in rats.
The objectives of this study were to determine the effects of feeding of four vegetables commonly consumed in Thailand, namely, flowers of the neem tree (Azadirachta indica var. siamensis), fruits of Thai and the Chinese bitter gourd (Momordica charantia Linn.) and leaves of sweet basil (Ocimum basilicum Linn) on the levels of phase I enzymes, which include cytochrome P450 (P450), aniline hydroxylase (ANH) and aminopyrine-N-demethylase (AMD) as well as the capacity to activate the mutagenicities of aflatoxin B1 (AFB1) and benzo[a]pyrene (BaP), and to induce the phase II enzymes [i.e. glutathione S-transferase (GST)] in rat liver. It was found that feeding of the diets containing 12.5% neem flowers and Thai bitter gourd fruits for 2 weeks strongly enhanced GST activity, 2.7- and 1.6-fold of the pair-fed control values, respectively, while resulting in a marked reduction of the levels of most phase I reactions. Fruits of the Chinese bitter gourd, which is in the same species as Thai bitter gourd, had no effect on GST activity but decreased AMD activity and the in vitro metabolic activation of AFB1 and BaP. On the other hand, however, dietary sweet basil leaves caused a significant increase in the levels of both GST and all phase I enzymes. Results in the present study clearly demonstrate that neem flowers and Thai bitter gourd fruits contain monofunctional phase II enzyme inducers and compounds capable of repressing some monooxygenases, especially those involved in the metabolic activation of chemical carcinogens, while sweet basil leaves contain compounds, probably bifunctional inducers, capable of inducing both phase I and phase II enzymes and Chinese bitter gourd fruits contain only compounds capable of repressing some monooxygenases. These results therefore suggest that neem flowers and Thai bitter gourd fruits may possess chemopreventive potential, while those of Chinese bitter gourd fruits and sweet basil leaves are uncertain.

PMID: 9674955 [PubMed - indexed for MEDLINE]


Ethnobotanical survey of the medicinal flora used by the Caribs of Guatemala.

Giron LM, Freire V, Alonzo A, Caceres A.

Center for Mesoamerican Studies on Appropriate Technology (CEMAT), Guatemala City.

An ethnobotanical survey was conducted among the Carib population of Guatemala in 1988-1989. In general terms, the sample surveyed possessed a relatively good standard of living. Results indicated that health services were utilized by the population, and that domestic medicine, mainly plants (96.9%) was used by 15% of the population. One hundred and nineteen plants used for medicinal purposes were collected, of which 102 (85.7%) could be identified; a list of these together with the information provided for each plant is presented. The most frequently reported plants used as medicine are: Acalypha arvensis, Cassia alata, Cymbopogon citratus, Melampodium divaricatum. Momordica charantia, Neurolaena lobata, Ocimum basilicum, Petiveria alliacea and Solanum nigrescens. Most of these plants are found in the region, but some are brought from the Highlands or outside of the country, such as Malva parviflora, Matricaria chamomilla, Pimpinella anisum, Rosmarinus officinalis and Tagetes lucida. This survey demonstrated that the Carib population of Guatemala has survived in a transcultural environment of African and native Amerindian beliefs.
Evaluation of the gastric antiulcerogenic effects of Solanum nigrum, Brassica oleracea and Ocimum basilicum in rats.

Akhtar MS, Munir M.

Department of Physiology and Pharmacology, University of Agriculture, Faisalabad, Pakistan.

Antiulcerogenic activities of three plant drugs were studied against aspirin-induced gastric ulcers in rats. In addition, their effects on output of gastric acid and pepsin and hexosamine concentrations in gastric fluid were recorded in ulcerated and non-ulcerated rats. Solanum nigrum (aerial parts) powder and its methanolic extract decreased the ulcer index significantly. The activity may be due to inhibition of acid and pepsin secretions and/or their in vitro ability to bind these. Brassica oleracea (leaf) powder did not affect the ulcer index significantly but its aqueous extract lowered the index and increased hexosamine levels, suggesting gastric mucosal protection. Ocimum basilicum (aerial parts) powder and its aqueous and methanolic extracts decreased the index. Moreover, the acid output was decreased by its methanolic extract while hexosamine secretion was enhanced. This suggests that its antiulcerogenic effect is due to decreases of acid and pepsin outputs which enhance gastric mucosal strength. The reference drug gefarnate decreased the ulcer index by increasing the hexosamine level only. Cimetidine inhibited the acid production but did not decrease the ulcer index.
the most common house-hold, road-side plants are mango (Mangifera indica),
neem (Azadirachta indica; Melia azadirachta), ocimum (Ocimum basilicum),
tea-dust (Camellia sinensis) and uncommonly murayya, i.e., currey leaf
(Murayya koenigi) [Chopra et al. 1958, Kirtikar and Basu 1935, Nadakarni
1954, Satyavati 1984]. The leaves of these plants are folded and brushed
(massage with tea-dust) against the teeth. Therefore, the present study is
restricted only to the fleshy leaf extracts [Jindal et al. 1975] (except tea) of
these plants inspite of certain limitations in the methodology and arbitrations in
the microbial identification and isolation in the light of recent advances in folk
dentistry. The investigation was carried out in two parts: 1) Experimental study:
The efficacy of various dentifrices (commonly available in the market) and the
potentiating effect of the leaf extract (LE) of the aforesaid indigenous plants
when amalgamated with the tooth-paste against pathogens, were investigated.
Further, the protection afforded by the said plant extracts (PE) over the
conventional allopathic medicines on the human plaque cultures and gram
negative bacteria from patients were studied. 2) Clinical study: The therapeutic
effects of the said PE (individually) on clinical application among severely
infected patients were examined.

Publication Types:
• Review
• Review, Tutorial

PMID: 3042642 [PubMed - indexed for MEDLINE]


Natural inhibitors of complement. III. Inactivation of the complement cascade in
vitro by vegetal spices (Ocimum basilicum, Artemisia dracunculus and Thymus
vulgaris).

Gancevici GG, Popescu C.

PMID: 3503653 [PubMed - indexed for MEDLINE]


Ocimum basilicum in acne vulgaris--a controlled comparison with a standard
regime.

Balambal R, Thiruvengadam KV, Kameswarant L, Janaki VR, Thambiah AS.

PMID: 2932427 [PubMed - indexed for MEDLINE]


Mosquito larvicidal activity of Ocimum basilicum Linn.

Chavan SR, Nikam ST.

PMID: 7085018 [PubMed - indexed for MEDLINE]


Effect of volatile substances released from Origanum majorana and Ocimum
basilicum on the rhizosphere and phyllosphere fungi of Phaseolus vulgaris.

Afifi AF.

Differences were found in the counts and occurrence of fungi in the
phyllosphere and rhizosphere of two representatives of the Lamiacea family,
Origanum majorana and Ocimum basilicum, and in the phyllosphere and
rhizosphere of Phaseolus vulgaris growing separately or in coenosis with O.
majorana or O. basilicum. Both the volatile substances released from ground leaves of the two latter plant species and the root exudates affected considerably spore germination of isolated phylospheric and rhizospheric fungi. The results indicated a possible role of root exudates and volatile substances released from leaves in colonization of rhizosphere and/or phyllosphere by fungi, especially in associations of various plants.

PMID: 700527 [PubMed - indexed for MEDLINE]
Effect of volatile substances from Origanum majorana and Ocimum basilicum on spore respiration and germination of some soil fungi.
Afifi AF, Dowidar AE.

Oxygen uptake by the spores of Fusarium moniliforme, F. oxysporum, F. semiteectum, F. solani, Mucor racemosus and Trichoderma viride was increased in the presence of volatile substances extracted from Origanum majorana and Ocimum basilicum. This increase was greater in the presence of volatile substances from O. basilicum than O. majorana, except in the case of F. semiteectum where the reverse was true. A drop in the RQ of all the germinating spores was observed in the presence of these substances. Volatile substances from O. majorana reduced the spore germination of M. racemosus whereas the spores of T. viride were stimulated to germinate. Volatile substances from O. basilicum stimulated the spore germination of M. racemosus whereas T. viride spores were not affected.

PMID: 570540 [PubMed - indexed for MEDLINE]
Therapeutic utility of Ocimum basilicum var. album.
Jain ML, Jain SR.

PMID: 5083250 [PubMed - indexed for MEDLINE]
Determination of sterol and triterpene content of Ocimum basilicum and Salvia officinalis at various stages of growth.
NICHOLAS HJ.

PMID: 13728754 [PubMed - OLDMEDLINE for Pre1966]

Alfazema - Lavandula officinalis

[Diuretic activity of the infusion of flowers from Lavandula officinalis]
[Article in French]
Elhajili M, Baddouri K, Elkabbaj S, Meiouat F, Settaf A.
Departement de Biologie, UFR Endocrinienne et Plantes Medicinales du Bassin Mediterraneen, Faculte des Sciences, Universite Mohammed V Rabat, Maroc.
baddouri_khadija@hotmail.com

The diuretic activity of an infusion of Lavandula officinalis was studied in the
Wistar rat. Thus, the kinetics of hydroelectrolytic elimination in response to the oral administration of an infusion of pharmaceutical lavender flowers were measured in the rats. Experiments were completed under similar conditions using a synthetic pharmacological diuretic, Diamox. The aqueous extract of this aromatic plant accelerated the elimination of the water overload. At the peak of the diuretic response, urinary osmolarity was significantly less than that of controls (111 +/- 14 vs. 195 +/- 11 mosmol x kg(-1)). Sodium excretion was moderate following administration of the infusion when compared to the synthetic diuretic. The stability of the aldosterone concentrations in the plasma and the absence of correlation with plasma sodium concentrations, coupled with the observed clearance of the free water (0.055 +/- 0.007 vs. 0.045 +/- 0.012 mL x min(-1)) show that the increase in diuresis and the moderate increase in sodium excretion are of tubular origin. The result of the phytochemical analysis of hexane extracts in the infusion and in urine indicated that four or five chemical factors may be involved in the diuretic effect of lavender.

PMID: 12014366 [PubMed - indexed for MEDLINE]


[Lavandula officinalis L., the lavender].

[Article in Undetermined Language]

KREITMAIR H.

PMID: 14833902 [PubMed - OLDMEDLINE for Pre1966]

Algodoeiro - Gossypium herbaceum


[Observation on the biological properties of cotton root skin (Gossypium herbaceum L.) extract upon fertility and gestation in rats (author's transl)]

[Article in Portuguese]

Peters VM, Campos AL, Andrade AT, Guerra MD.

PMID: 7399111 [PubMed - indexed for MEDLINE]


Antifertility screening of plants. VI. Effect of five indigenous plants on early pregnancy in albino rats.

Garg SK, Saksena SK, Chaudhury RR.

PIP: The petroleum ether, alcoholic and aqueous extracts of Apium graveolens Linn., Butea monosperma Lam. Kuntz., and Gossypium herbaceum Linn., the aqueous extract of Aloe Barbadensis Mill., and the juice of unripe fruits of Ananas comosus were tested on albino rats by a method which detects any antizygotic, blastocystotoxic, antiimplantation, and early abortifacient activity. The extracts were administered for 1-7 days. The dosages for A. graveolens, B. monosperma, and G. herbaceum were 100 mg/kg. 50 ml of A. comosus juice was administered daily. Dosages of 100, 200, and 500 mg/kg of A. barbadensis were given. With the exception of A. comosus, none of the plants showed any antiimplantation activity. The juice of the unripe fruits of A. comosus demonstrated encouraging antiimplantation activity showing 40% of implants only.

PMID: 5505214 [PubMed - indexed for MEDLINE]
Alho - Allium sativum


Effect of garlic oil on ethanol induced gastric ulcers in rats.

Khosla P, Karan RS, Bhargava VK.

Department of Pharmacology, Postgraduate Institute of Medical Education and Research, Chandigarh 160012, India.

Garlic oil was evaluated for gastroprotective activity against ethanol induced ulcers. Reactive oxygen species are involved in the pathogenesis of these ulcers. The possible involvement of garlic oil in restraining the oxidation process produced in gastric tissue was also investigated. The ulcer index, lipid peroxidation and antioxidant enzyme activity (GPx, catalase, SOD) were determined. Pretreatment with garlic oil in doses of 0.25 and 0.5 mg/kg, 30 min before administration of ethanol (1 mL of 100%) caused a decrease in ulcer index and lipid peroxidation and ameliorated the decrease in antioxidant enzyme levels caused by ethanol. The result suggests that garlic oil possesses antioxidant properties and provides protection against ethanol induced gastric injury. Copyright 2004 John Wiley & Sons, Ltd.

PMID: 14750208 [PubMed - indexed for MEDLINE]


Eat your garlic!

[No authors listed]

Publication Types:
• Review
• Review, Tutorial

PMID: 14696636 [PubMed - indexed for MEDLINE]

J Pract Nurs. 2003 Fall;53(3):5-8, 25-9; quiz 20-1, 23.

Commonly used herbs.

Cuddy ML.

Publication Types:
• Review
• Review, Tutorial

PMID: 14694750 [PubMed - indexed for MEDLINE]


The combined effects of Trigonella and Allium extracts in the regulation of hyperthyroidism in rats.

Tahiliani P, Kar A.

Thyroid Research Unit, School of Life Sciences, UTD, Devi Ahilya University, Takshashila Campus, Indore, India.

The combined effects of Trigonella foenum-graecum and Allium sativum extracts were evaluated for their ameliorative potential in the L-thyroxine-induced hyperthyroidic rat model to contribute to an understanding of interaction between the two extracts. The investigation was carried out using two different
doses. A comparison was made with the response of individual plant extracts at the previously studied effective dose in adult Wistar rats rendered hyperthyroidic by daily injections of L-thyroxine (300 microg/kg body wt., s.c.). Propylthiouracil (PTU), an antithyroid drug, was used as a reference compound. Alterations in serum triiodothyronine (T3), thyroxine (T4), glucose, hepatic glucose-6-phosphatase (G-6-Pase) and oxygen consumption were studied as end parameters. Superoxide dismutase (SOD), catalase (CAT) activities, lipid peroxidation (LPO) and reduced glutathione (GSH) were examined to reveal any toxic effects of the drugs. The combined effects of Trigonella and Allium at 200 and 500 mg/kg body wt. respectively, were equipotent as compared to the individual extracts in lowering the serum concentrations of T3 and T4 in hyperthyroidic rats. Our findings reveal that some plant extracts in combination may not always prove to be synergistic. It is therefore suggested that Trigonella foenum-graecum and Allium sativum extracts may be used individually and not together in the regulation of hyperthyroidism.

PMID: 14692727 [PubMed - indexed for MEDLINE]

Inhibition of N-acetyltransferase activity and gene expression in human colon cancer cell lines by diallyl sulfide.

Chung JG, Lu HF, Yeh CC, Cheng KC, Lin SS, Lee JH.

Department of Microbiology, China Medical University, No 91 Hsueh-Shih road, 400 Taichung, Taiwan, Republic of China.

Diallyl sulfide (DAS) is one of the major components of garlic (Allium sativum) and is widely used in the world for food. In this study, DAS was selected for testing the inhibition of arylamine N-acetyltransferase (NAT) activity (N-acetylation of 2-aminofluorene) and gene expression (mRNA NAT) in human colon cancer cell lines (colo 205, colo 320 DM and colo 320 HSR). The NAT activity was examined by high performance liquid chromatography and indicated that a 24 h DAS treatment decreases N-acetylation of 2-aminofluorene in three colon (colo 205, 320 DM and colo 320 HSR) cancer cell lines. The NAT enzymes (protein) were analyzed by western blotting and flow cytometry and it indicated that DAS decreased the levels of NAT in three colon (colo 205, 320 DM and colo 320 HSR) cancer cell lines. The gene expression of NAT (mRNAT NAT) was determined by polymerase chain reaction (PCR), it was shown that DAS affect mRNA NAT expression in examined human colon cancer cell lines. This report is the first to demonstrate that DAS does inhibit human colon cancer cell NAT activity and gene expression.

PMID: 14667466 [PubMed - indexed for MEDLINE]


The effect of herbal remedy on the development of Trichinella spiralis infection in mice.

Bany J, Zdanowska D, Zdanowski R, Skopinska-Rozewska E.

Department of Pharmacology and Toxicology, Military Institute of Hygiene and Epidemiology, Kozielska 4, 01-163 Warsaw, Poland.

The effect of Alchinal (a complex preparation consisting of three substances: Echinacea purpurea extract, Allium sativum extract, cocoa) on the development of Trichinella spiralis infection in mice was studied. The preparation was administered to the animals orally, twice a day in 30 microl doses for 10 days after infecting mice with Trichinella larvae (500 larvae per mouse). It was demonstrated that after Alchinal administration, the number of adult forms (10
dpi—days post infection) and muscular larvae (36 dpi) significantly decreased. It is suggested that the remedy studied causes antiparasitic immunity enhancement in mice. Modulation of immunity by individual component(s) and/or joint action of the substances contained in Alchinal increases the antiparasitic defence of the organism.

PMID: 14509349 [PubMed - indexed for MEDLINE]


Effect of garlic on lipid profile and psychopathologic parameters in people with mild to moderate hypercholesterolemia.


Department of Criminology, Bar Ilan University, Ramat Gan, Israel.

BACKGROUND: The beneficial effect of 3-hydroxy-3-methylglutaryl co-enzyme A reductase inhibitors on cardiovascular risk reduction has been clearly established. Concerns have been raised that lowering blood cholesterol by other hypolipidemic drugs or by a non-pharmacologic approach may have deleterious effects on psychopathologic parameters. Garlic is one of the most commonly used herbal remedies and is considered to have hypocholesterolemic as well as other cardioprotective properties. Its effect on psychopathologic parameters has never been reported. OBJECTIVE: To evaluate the effect of garlic on lipid parameters and depression, impulsivity, hostility and temperament in patients with primary type 2 hyperlipidemia. METHODS: In a 16 week prospective double-blind placebo-controlled study, 33 patients with primary hypercholesterolemia and no evidence of cardiovascular disease were randomly assigned to receive either garlic or placebo. Garlic in the form of alliin 22.4 mg/day was given to 13 patients, and placebo to 20. Both groups received individual dietary counseling. The changes in lipid profile and the various psychopathologic parameters were determined at the beginning and end of the trial. The differences in lipid parameters were evaluated by Student's t-test. The psychological data were analyzed by one-way analysis of variance (ANOVA) with repeated measures and Neuman-Keuls test. RESULTS: No significant changes were observed in levels of total cholesterol, low density lipoprotein-cholesterol, high density lipoprotein-cholesterol and triglycerides, or in the psychopathologic parameters evaluated. CONCLUSION: Short-term garlic therapy in adults with mild to moderate hypercholesterolemia does not affect either lipid levels or various psychopathologic parameters.

Publication Types:
• Clinical Trial
• Randomized Controlled Trial

PMID: 14509153 [PubMed - indexed for MEDLINE]

Phytomedicine. 2003;10(6-7):474-82.

Antiatherogenic effect of Caps HT2, a herbal Ayurvedic medicine formulation.

Mary NK, Babu BH, Padikkala J.

Amala Cancer Research Centre, Thrissur, Kerala, India.

The antiatherogenic effect of a herbal formulation, Caps HT2, was evaluated as antioxidant, anticoagulant, platelet antiaggregatory, lipoprotein lipase releasing, anti-inflammatory and hypolipidaemic activity in rats. The formulation contained the methanolic extracts of selected parts of plants, Commiphora mukul, Allium sativum, Plumbago indica, Semecarpus anacardium, Hemidesmus indicus, Terminalia arjuna, Tinospora cordifolia, Withania somnifera and Ocimum sanctum. The formulation, Caps HT2 was found to scavenge superoxide and
hydroxyl radicals; the IC50 required being 55.0 and 610.0 microg/ml respectively. The lipid peroxidation was found inhibited (50%) by 48.5 microg/ml of Caps HT2. The intravenous administration of the formulation (5 mg/kg) delayed the plasma recalcification time in rabbits and enhanced the release of lipoprotein lipase enzyme significantly (p < 0.001). The formulation also inhibited ADP induced platelet aggregation in vitro, which was comparable to commercial heparin. The anti-inflammatory action of the formulation was significant (p < 0.001) with acute and chronic inflammations induced by carrageenan and formalin respectively in rats. The hypolipidaemic effect of Caps HT2 was significant (p < 0.001) with the administration of the formulation, in diet-induced hyperlipidaemia of rats for a period of 30 days. Oral administration of the formulation, Caps HT2 (100, 200, 300 and 400 mg/kg) significantly raised HDL cholesterol levels. The atherogenic index and the reduction in body weight were significant indicating the effectiveness against hyperlipidaemia and obesity. All these results revealed the therapeutic potential of Caps HT2 against vascular intimal damage and atherogenesis leading to various types of cardiovascular problems.

PMID: 13678230 [PubMed - indexed for MEDLINE]


[Noncompliance or too much garlic? When phytotherapy drugs interact with HIV therapy]

[Article in German]

Gey D, Luer S, Stephan M, Hartmann M.

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Publication Types:
• Case Reports

PMID: 12958776 [PubMed - indexed for MEDLINE]


Retinoic acid receptor-beta mRNA expression during chemoprevention of hamster cheek pouch carcinogenesis by garlic.

Balasenthil S, Rao KS, Nagini S.

Department of Biochemistry, Faculty of Science, Annamalai University, Annamalainagar, Tamil Nadu, India.

The effect of aqueous garlic (Allium sativum Linn.) on retinoic acid receptor beta (RARbeta) mRNA expression was investigated in male Syrian hamsters during 12-dimethyl enz[a]anthracene (DMBA)-induced hamster buccal pouch (HBP) carcinogenesis. RARbeta mRNA expression was analysed by slot blotted hybridization with radiolabelled RAR-beta probe. In DMBA-induced HBP tumours, decreased expression of RARbeta mRNA was observed. Administration of garlic (250mg/kg body weight) to animals painted with DMBA restored RARbeta mRNA expression to normal pattern suggesting that this may be one of the mechanisms by which garlic exerts its chemopreventive effects.

PMID: 12810414 [PubMed - indexed for MEDLINE]


Tomato and garlic can modulate azoxymethane-induced colon carcinogenesis in rats.
Sengupta A, Ghosh S, Das S.

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Tomato (Lycopersicon esculentum) and garlic (Allium cepa) are important constituents of the human diet. Compounds like diallyl sulfides, diallyl disulfides and quercetin, which are active components of garlic, have known anti-inflammatory, antimutagenic activities. Similarly, active components in tomato, such as kaempferol and chlorogenic acid, have antimutagenic activities and lycopene is the most active oxygen quencher with potential chemopreventive activities. In view of this, an endeavour was made to evaluate the anticarcinogenic effect, if any, of tomato and garlic consumption individually and in combination on azoxymethane-induced colonic precancerous lesion, the aberrant crypt foci in animal model. Sprague-Dawley rats (4-5 weeks old) were injected with azoxymethane (15 mg/kg b.w.) and orally administered with 2% (w/v) of tomato, garlic and a combination of both. After 12 weeks of first azoxymethane injection, colons were assessed for aberrant crypt foci and compared with the carcinogen control group. Lipid peroxidation level and glutathione-S-transferase (GST) activity were assessed in liver as well as in colon. Furthermore, in situ cell proliferation and apoptosis were estimated using the BrdU incorporation method and TUNEL method respectively. It was observed that aberrant crypt foci were reduced in all treated groups (by 32.11% in garlic, by 76.14% in tomato and by 55.96% in the combination group). Among treated groups, GST activity was found to be induced in both liver and colon, whereas considerable reduction in lipid peroxidation level was observed in liver as well as in colon with respect to the carcinogen control group. Significant reduction in BrdU labelling index and increase in apoptotic index in colon was noted in the treated groups. These results suggest that tomato and garlic suspensions have a protective effect on colon carcinogenesis, which is mediated by modulation of different biological pathways during carcinogenesis.

PMID: 12771557 [PubMed - indexed for MEDLINE]


Herbs commonly used by women: an evidence-based review.

Tesch BJ.

Division of General Internal Medicine, Medical College of Wisconsin, Milwaukee 53226, USA.

OBJECTIVE: To review the evidence of herbs commonly used by women. DATA SOURCES: Articles were located by searching Medline, Cochrane Database of Systemic Reviews, and the Combined Health Information Database and by hand searching the reference lists of recent systematic reviews. The databases were searched in January 2000 and October 2000 by using the Latin and common name of each herb. METHODS OF STUDY SELECTION: Preference was given to randomized, placebo-controlled trials. When available, English language studies were reviewed. If not, data are presented from review articles that summarize the foreign study. RESULTS: Many women use herbal therapies. In the United States, herbs are considered dietary supplements. The Food and Drug Administration (FDA) cannot remove them from the market unless they are proven unsafe. The herb industry plans to improve monitoring. Many prospective randomized controlled trials are being funded. Gingko biloba seems to slow the progression of dementia but increases the risk of bleeding. St John's Wort is efficacious for treating mild to moderate depression but has many drug interactions. Ginseng seems to improve well being in perimenopausal women, but it is often impure and has side effects and drug interactions. Garlic slightly lowers blood pressure and
lipids. Echinacea slightly decreases the duration of colds but does not prevent them. Valerian is beneficial for insomnia, but there is no long-term safety data. Black cohosh may help the symptoms of perimenopause, and chasteberry may improve premenstrual syndrome. More study is needed on both herbs.

CONCLUSION: Some herbs are medically useful, but the American public would benefit from increased regulation. Manufacturers should be able to ensure that herbs contain pure ingredients. Side effects and drug interactions should be listed. Well-designed studies are being conducted. The results will be helpful to physicians and patients when the clinical evidence becomes available.

Publication Types:
• Review
• Review, Tutorial

PMID: 12748451 [PubMed - indexed for MEDLINE]


Screening of traditionally used South African plants for antifungal activity against Candida albicans.

Motsei ML, Lindsey KL, van Staden J, Jager AK.

Research Centre for Plant Growth and Development, School of Botany and Zoology, University of Natal Pietermaritzburg, Private Bag X01, Scottsville 3209, South Africa.

Twenty-four South African medicinal plants were screened against Candida albicans standard strain ATCC 10231 and two clinical isolates from a 5-month-old baby and an adult, in an attempt to find a traditional remedy to treat oral candidiasis, which is prevalent in HIV-patients. Allium sativum L. and Tulbaghia violacea L. aqueous bulb extracts had MIC values of 0.56 and 3.25mg/ml respectively, whilst Polygala myrtifolia L. leaves and Glycyrrhiza glabra L. rhizome extracts had MIC values of 1.56 mg/ml when tested against the 5-month-old isolate. Fresh water extracts stored at 4, 23 and 33 degrees C over a period of a week, were used to determine the stability of these extracts. Allium sativum and Tulbaghia violacea maintained activity at 4 degrees C, but not at higher temperatures, whereas Polygala myrtifolia and Glycyrrhiza glabra lost activity within a day even at 4 degrees C. The unpleasant taste of the two species with a garlic smell, could however not be masked, and as the smell following the eating of the two species would lead to HIV-patients being recognised, these two plants where not considered for further investigation. Therefore, Polygala myrtifolia and Glycyrrhiza glabra are being further investigated for use as an oral mouthwash in clinics and homes.

PMID: 12738093 [PubMed - indexed for MEDLINE]


Investigation of antihypertensive mechanism of garlic in 2K1C hypertensive rat.

Sharifi AM, Darabi R, Akbarloo N.

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This study sought to examine the antihypertensive mechanism of garlic in two-kidney-one-clip (2K1C) hypertensive rat. In this study, the effect of garlic on serum and tissue including: aorta, heart, kidney, lung as well as circulatory (serum) ACE activity in 2K1C rats were examined. Four groups of rats were selected: control "CTL", sham-operated "SHAM", hypertensive "H" and garlic-treated hypertensive "GT" group. Hypertension was induced by surgery. Four weeks post-clipping, single daily dose of 50mg of aqueous extract of garlic was
given orally to "GT" rats for 4 weeks. Blood pressure was measured by tail-cuff method. ACE activity was determined using HPLC. The systolic blood pressure (SBP) was significantly increased in "H" compared to "CTL" group. In "GT" group, blood pressure was significantly decreased compared to "H" group. The ACE activity in all tissues of "H" group was significantly increased compared to controls which was significantly decreased in garlic-treated compared to non-treated hypertensive rats. These results indicated a negative correlation between consumption of garlic, blood pressure and ACE activity in serum and different tissues in 2K1C rats, suggesting that garlic has a significant blood pressure lowering effect, which could partly be mediated by reduction in ACE activity.

PMID: 12738090 [PubMed - indexed for MEDLINE]


Comment in:
• J Fam Pract. 2003 Sep;52(9):673, 676.

Naturopathic treatment for ear pain in children.

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OBJECTIVE: Otitis media is 1 of the most frequent diseases of early infancy and childhood and 1 of the most common reasons for children to visit a physician. In the past 2 decades, there has been a substantial increase in the diagnosis of otitis media worldwide. In the United States, 93% of all children have had at least 1 episode of acute otitis media (AOM) by 7 years of age. Otalgia is the hallmark of AOM. Most affected children either complain of earache or manifest behavior that the parents interpret as indicating ear pain. Treatment of the ear pain early in the course of AOM decreases both parental anxiety and the child's discomfort and accelerates the healing process. The objective of this study was to determine the efficacy and tolerability of naturopathic versus traditional treatment for the management of otalgia commonly associated with AOM in children. METHODS: The study was designed as a double-blind trial in an outpatient community clinic. A total of 171 children who were aged 5 to 18 years and had otalgia and clinical findings associated with middle-ear infection were studied. The children were randomly assigned to receive treatment with Naturopathic Herbal Extract Ear Drops (NHED) or anesthetic ear drops, with or without amoxicillin. On enrollment, the children were assigned by computer-numbered randomization to receive NHED (contents: allium sativum, verbascum thapsus, calendula flores, hypericum perforiatum, lavender, and vitamin E in olive oil) 5 drops 3 times daily, alone (group A) or together with a topical anesthetic (amethocaine and phenazone in glycerin) 5 drops 3 times daily (group B), or oral amoxicillin 80 mg/kg/d (maximum 500 mg/dose) divided into 3 doses with either NHED 5 drops 3 times daily (group C) or topical anesthetic 5 drops 3 times daily (group D). A double-blind design was used, and all ear drops were placed in identical bottles. Treatment was initiated by the nurse in all cases. A single physician (M.S.) evaluated and treated all of the patients included in the study and recorded all of the data. The presence or absence of ear pain was assessed over 3 days with a visual analog scale. Ear pain was assessed by a specially devised observational instrument based on previous reports. One side of the instrument consisted of a linear numbered scale, from 1 (no pain) to 10 (worst possible pain), and a corresponding color scale, ranging from blue to dark red. The reverse side contained a scale of 5 facial expressions, ranging from broad smile (no pain) to a sad and crying face (worst possible pain), and a corresponding color scale, ranging from blue to dark red. RESULTS: There were no significant between-group differences in patient age or gender, degree of fever, main symptoms, associated symptoms, and severity or laterality of
acute otitis media. Each group had a statistically significant improvement in ear pain over the course of the 3 days. Patients who were given ear drops alone had a better response than patients who were given ear drops together with amoxicillin. Results were better in the NHED group than in the controls. Nevertheless, the findings indicated that the pain was mostly (80%) self-limited and could be explained simply by the time elapsed. The American Academy of Otolaryngology-Head and Neck Surgery guidelines recommend topical medications as the first line of treatment for ear pain in the absence of systemic infection or serious underlying disease. Because no evidence was found that systemic antibiotics alone improved treatment outcome, if antibiotics do not change the natural course of otitis media, then the main goal of treatment, as in the present study, should be to alleviate the ear pain. The alternative, naturopathic herbal extract medications, may offer many new possibilities in the management of ear pain associated with AOM. Primary care physicians should be aware that at least 10% of their patients may have tried 1 or more forms of alternative/complementary medicine before presenting for consultation. As it was widely reported in the medical literature, these herbal, these herbal extracts have the potential to meet all of the requirements of appropriate medication that could be routinely used in the pediatric patient, namely in vitro bacteriostatic and bacteriocidal activity against common pathogens, immunostimulation ability, antioxidant activity, and anti-inflammatory effects. They are also well-absorbed with good penetration into the tissue surrounding the tympanic membrane. They have been found to enhance local immunologic activity. Finally, herbal extracts are well-tolerated (owing to their long elimination time), easy to administer, and less expensive than the new antibiotics. There are no documented side effects. On the basis of our findings that the group with the most significant treatment effects (NHED with topical anesthetic) explained only 7.3% of the total pain reduction, we propose that sometimes the general practitioner or pediatrician needs to give the human body a chance to repair itself. Nevertheless, if the physician believes that there is an indication for some treatment, especially if the parents are anxious, then a local treatment such as one used in our study might be adequate. CONCLUSIONS: This study suggests that in cases of ear pain caused by AOM in children in which active treatment, besides a simple 2- to 3-day waiting period, is needed, an herbal extract solution may be beneficial. Concomitant antibiotic treatment is apparently not contributory.
Evidence-based scales unsuitable. Lactobacillus recolonization (via yogurt or capsules) shows promise for the treatment of both yeast vaginitis and bacterial vaginosis with little potential for harm. Boric acid can be recommended to women with recurrent vulvovaginal Candidal infections who are resistant to conventional therapies, but can occasionally cause vaginal burning. Because of associated risks in the absence of well-documented clinical benefits, douching remains a practice that should not be recommended for the treatment of vaginitis. Finally, tea tree oil and garlic show some in vitro potential for the treatment of vaginitis, but the lack of in vivo studies preclude their recommendation to patients for the time-being. The available evidence for CAM treatments of vaginitis is of poor quality despite the prevalent use of these therapies. Well-designed randomized, controlled trials investigating the efficacy and safety of these therapies for vaginitis are needed before any reliable clinical recommendations can be made. TARGET AUDIENCE: Obstetricians & Gynecologists, Family Physicians. LEARNING OBJECTIVES: After completion of this article, the reader will be able to list the most common complementary and alternative medicine therapies for vaginitis, summarize the data surrounding the efficacy of each therapy, describe the adverse affects of each therapy, and outline which therapies are recommended and not recommended for vaginitis.

Publication Types:
- Review
- Review, Tutorial

PMID: 12719677 [PubMed - indexed for MEDLINE]


Has garlic earned its healthy reputation?

[No authors listed]

PMID: 12714942 [PubMed - indexed for MEDLINE]


[Careful with herbal medicines!]

[Molina CN.]

Publication Types:
- Newspaper Article

PMID: 12703474 [PubMed - indexed for MEDLINE]


Mitigation of thyroxine-induced hyperglycaemia by two plant extracts.

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Extracts of Trigonella foenum-graecum (TFG) seed and Allium sativum (AS) bulb were evaluated for their efficacy to ameliorate l-thyroxine (L-T4) induced hyperglycaemia in rats. Simultaneously, the serum cholesterol concentration, a supporting parameter for thyroid function, was also estimated. Thyroxine treatment in rats (300 microg/kg b. wt./day) increased the levels of both the thyroid hormones, namely thyroxine (T4) and tri-iodothyronine (T3) with a concomitant elevation in serum glucose concentration and a reduction in serum

cholesterol level. Administration of TFG (220 mg/kg/day) and AS (500 mg/kg/day) extracts in hyperthyroid animals decreased the serum glucose concentration as well as the serum thyroid hormones. For comparison, propyl thiouracil (PTU), an antithyroid compound, was used as the standard at a daily dose of 10 mg/kg. The reductions in serum glucose and thyroid hormone concentrations in the plant extract treated groups were comparable to that in PTU treated animals. Our findings indicate that TFG seed and AS bulb extracts may prove to be effective in the treatment of thyroxine-induced hyperglycaemia. 

PMID: 12672166 [PubMed - indexed for MEDLINE]


The protective effect of Allium sativum L. clove aqueous and methanolic extracts against hypoxia-induced lethality in mice.

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The antihypoxic activity of Allium sativum clove (garlic) aqueous and methanolic extracts was studied in mice. The extracts of garlic showed that the antihypoxic effect was dose-dependent. The minimum effective doses of aqueous and methanolic extracts were 0.2 g/kg and 5.12 g/kg, respectively. Phenytoin, 50 mg/kg, and R-phenylisopropyladenosine (R-PIA), 1.6 mg/kg (R-PIA) as positive controls increased survival time up to 52.5 +/- 2.9 min and 120.5 +/- 6 min, respectively, compared to normal saline (34.73 +/- 0.71 min). The high doses of aqueous (16.9 g/kg) and methanolic (12.8 g/kg) extracts increased survival time up to 73.17 +/- 4.9 and 68.41 +/- 3.7, respectively. These results indicated that the extracts of A. sativum cloves have a protective effect against hypoxia-induced lethality in mice. Copyright 2003 John Wiley & Sons, Ltd.

PMID: 12672162 [PubMed - indexed for MEDLINE]


Investigation on the antibacterial properties of garlic (Allium sativum) on pneumonia causing bacteria.


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The antibacterial activity of the crude aqueous extract of garlic was investigated against some pneumonia causing bacteria by an agar dilution technique. The results revealed that Streptococcus pneumoniae standard test organism was completely inhibited by 7.8 mg/ml of media and the clinical isolate of Klebsiella pneumoniae was completely inhibited by 24.38 mg/ml of media, indicating that Streptococcus pneumoniae is the most sensitive and Klebsiella pneumoniae the least. Garlic could be used as an effective antibacterial agent for these pathogenic microorganisms.

PMID: 12602248 [PubMed - indexed for MEDLINE]


Garlic as an antioxidant: the good, the bad and the ugly.

Banerjee SK, Mukherjee PK, Maulik SK.
Garlic has played an important dietary and medicinal role throughout the history of mankind. In some Western countries, the sale of garlic preparations ranks with those of leading prescription drugs. The therapeutic efficacy of garlic encompasses a wide variety of ailments, including cardiovascular, cancer, hepatic and microbial infections to name but a few. However, the elucidation of its mechanism for therapeutic action has proved to be more elusive and a unifying theory, which could account for its reported multifarious activities, is yet to emerge. Reactive oxygen species (ROS) seem to be at the core of many disease processes and it is an attractive and convenient hypothesis that garlic might exert its activities through modulatory effects on ROS. A literature search on garlic and its antioxidant potential churned up a surprisingly large amount of data, some of it good, some bad and some of its definitely ugly. Various preparations of garlic, mainly aged garlic extract (AGE), have been shown to have promising antioxidant potential. However, the presence of more than one compounds in garlic, with apparently opposite biological effects, has added to the complexity of the subject. Raw garlic homogenate has been reported to exert antioxidant potential but higher doses have been shown to be toxic to the heart, liver and kidney. So where do we stand today on this issue of garlic? Is garlic always good for health? How safe is it? Is it necessary to isolate the antioxidant compounds for its medicinal use in a more effective way? These issues are addressed in this review. Copyright 2003 John Wiley & Sons, Ltd.

Publication Types:
• Review
• Review, Tutorial

PMID: 12601669 [PubMed - indexed for MEDLINE]


Cardiovascular benefits of garlic (Allium sativum L).

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Although garlic is believed to have health-promoting benefits, many of the claimed benefits are not supported by good scientific studies. This review critically examined current scientific literature concerning claims of cardiovascular benefits from regular consumption of garlic or garlic preparations. The vast majority of recent randomized, placebo-controlled studies do not support a role for garlic in lowering blood lipids. There also is insufficient evidence to support a role in reducing blood pressure. While there have been indications of antiatherosclerotic effects associated with garlic consumption, there are insufficient data in humans. Investigation of antithrombotic effects of garlic consumption appears to hold promise, but too few data exist to draw firm conclusions.

Publication Types:
• Review
• Review, Tutorial

PMID: 12597261 [PubMed - indexed for MEDLINE]


Garlic [Allium sativum]: a review of its potential use as an anti-cancer agent.
Garlic [Allium sativum] is among the oldest of all cultivated plants. It has been used as a medicinal agent for thousands of years. It is a remarkable plant, which has multiple beneficial effects such as antimicrobial, antithrombotic, hypolipidemic, antiarthritic, hypoglycemic and antitumor activity. In this review, we will discuss particularly the largely preclinical use of this agent in the treatment and prevention of cancer. A number of studies have demonstrated the chemopreventive activity of garlic by using different garlic preparations including fresh garlic extract, aged garlic, garlic oil and a number of organosulfur compounds derived from garlic. The chemopreventive activity has been attributed to the presence of organosulfur compounds in garlic. How this is achieved is not fully understood, but several modes of action have been proposed. These include its effect on drug metabolizing enzymes, antioxidant properties and tumor growth inhibition. Most of these studies were carried out in the animal models. Also, recent research has focused on the antimutagenic activity of garlic. Recently, it has been observed that aged garlic extract, but not the fresh garlic extract, exhibited radical scavenging activity. The two major compounds in aged garlic, S-allylcysteine and S-allylmercapto-L-cysteine, had the highest radical scavenging activity. In addition, some organosulfur compounds derived from garlic, including S-allylcysteine, have been found to retard the growth of chemically induced and transplantable tumors in several animal models. Therefore, the consumption of garlic may provide some kind of protection from cancer development.
Database and by hand searching the reference lists of recent systematic reviews. The databases were searched in January 2000 and October 2000 by using the Latin and common name of each herb. METHODS OF STUDY SELECTION: Preference was given to randomized, placebo-controlled trials. When available, English language studies were reviewed. If not, data are presented from review articles that summarize the foreign study. RESULTS: Many women use herbal therapies. In the United States, herbs are considered dietary supplements. The Food and Drug Administration (FDA) cannot remove them from the market unless they are proven unsafe. The herb industry plans to improve monitoring. Many prospective randomized controlled trials are being funded. Gingko biloba seems to slow the progression of dementia but increases the risk of bleeding. St John's Wort is efficacious for treating mild to moderate depression but has many drug interactions. Ginseng seems to improve well being in perimenopausal women, but it is often impure and has side effects and drug interactions. Garlic slightly lowers blood pressure and lipids. Echinacea slightly decreases the duration of colds but does not prevent them. Valerian is beneficial for insomnia, but there is no long-term safety data. Black cohosh may help the symptoms of perimenopause, and chasteberry may improve premenstrual syndrome. More study is needed on both herbs. CONCLUSION: Some herbs are medically useful, but the American public would benefit from increased regulation. Manufacturers should be able to ensure that herbs contain pure ingredients. Side effects and drug interactions should be listed. Well-designed studies are being conducted. The results will be helpful to physicians and patients when the clinical evidence becomes available.

Publication Types:
• Review
• Review, Tutorial

PMID: 12562054 [PubMed - indexed for MEDLINE]

[Importance of biologically active components and plants in the prevention of complications of diabetes mellitus]

[Article in Lithuanian]

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Diabetes complications, especially late (chronic) ones, are the main reasons of invalidity and early mortality. The most threatening diabetes complications are vascular and metabolic complications (diabetic neuropathy, angiopathy, cataract, glaucoma, optic neuropathy, retinopathy, diabetic nephropathy). Good diabetes control is very important, because in early stages these changes are reversible. In order to decrease the number of diabetes complications and to postpone their development, the use of biologic active components and plants is recommended. The most important biologic active substances for this purpose are vitamins and minerals, proteins, polysaccharides, lectins, saponins and flavonoids. According the scientific data, the mostly used plants are: Ginkgo biloba, Allium sativum, Silybum marianum, Panax Ginseng, Carica papaya, Vaccinium myrtillus, Phaseolus vulgaris. Some of them are proposed for treatment of symptoms related to venous and lymphatic vessel insufficiency, for the prophylaxis and treatment of liver damage caused by metabolic toxins, in chronic degenerative liver conditions, for the therapy of digestive disorders, to increase in the unspecific way the resistance of the organism to various environmental influences, and to stabilize membranes through antioxidant and radical scavenging actions.

PMID: 12532704 [PubMed - indexed for MEDLINE]
Effects of raw garlic on physical performance and learning behaviour in rats.

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The effects of garlic (Allium sativum Linn.) on physical performance and learning behaviour were evaluated in male rats (7-8 months old, weighing 250-400 g) by comparison with the effects of pentoxifylline, a haemorheological agent with antiplatelet activity. The tests were designated as experiment A and experiment B, both conducted in two consecutive 4-week sessions. In experiment A, the rats performed in a learning maze model during the first 4 weeks then followed by moving along the rope model for another 4 weeks. In experiment B, the rats were first tested in a rotarod treadmill for 4 weeks and then a step down test model for another 4 weeks. Each experiment consisted of four groups with 6-8 rats per group. Aqueous garlic homogenate at doses of 1 and 2 g (of raw garlic)/kg/day were given orally to group 1 and group 2, respectively, while pentoxifylline dispersion at a dose of 200 mg/kg/day was given to group 3. Group 4 served as the control group and was given water. All tests (maze model, rope model, rotarod model and step down model) were performed three times a week. The number of successful tasks and the acquisition time in 1 week intervals were used for the statistical analysis. The present results demonstrated that neither aqueous garlic homogenate at both doses nor pentoxifylline exhibited any benefit in the maze model or the rotarod model. Garlic only at the lower dose and pentoxifylline however, showed benefit in the rope model and step down model. These findings may provide some evidence to support the beneficial effect of long-term garlic consumption on physical performance and learning behaviour in normal subjects. Copyright 2002 John Wiley & Sons, Ltd.

PMID: 12458475 [PubMed - indexed for MEDLINE]


Garlic and aging: new insights into an old remedy.

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There has been an impressive gain in individual life expectancy with parallel increases in age-related chronic diseases of the cardiovascular, brain and immune systems. These can cause loss of autonomy, dependence and high social costs for individuals and society. It is now accepted that aging and age-related diseases are in part caused by free radical reactions. The arrest of aging and stimulation of rejuvenation of the human body is also being sought. Over the last 20 years the use of herbs and natural products has gained popularity and these are being consumed backed by epidemiological evidence. One such herb is garlic, which has been used throughout the history of civilization for treating a wide variety of ailments associated with aging. The role of garlic in preventing age-related diseases has been investigated extensively over the last 10-15 years. Garlic has strong antioxidant properties and it has been suggested that garlic can prevent cardiovascular disease, inhibit platelet aggregation, thrombus formation, prevent cancer, diseases associated with cerebral aging, arthritis, cataract formation, and rejuvenate skin, improve blood circulation and energy levels. This review provides an insight in to garlic's antioxidant properties and presents evidence that it may either prevent or delay chronic diseases associated with aging.
Publication Types:
• Review

PMID: 12437995 [PubMed - indexed for MEDLINE]


Garlic therapy. Loose labels.

Fischman J.

Publication Types:
• News

PMID: 12436788 [PubMed - indexed for MEDLINE]

Allium vegetables and risk of prostate cancer: a population-based study.


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Epidemiologic and laboratory studies suggest that allium vegetables and garlic constituents have antitumor effects. In a population-based, case-control study conducted in Shanghai, China, we investigated the association between intake of allium vegetables, including garlic, scallions, onions, chives, and leeks, and the risk of prostate cancer. We administered in-person interviews and collected information on 122 food items from 238 case subjects with incident, histologically confirmed prostate cancer and from 471 male population control subjects. Men in the highest of three intake categories of total allium vegetables (>10.0 g/day) had a statistically significantly lower risk (odds ratio [OR] = 0.51, 95% confidence interval [CI] = 0.34 to 0.76; P(trend)<.001) of prostate cancer than those in the lowest category (<2.2 g/day). Similar comparisons between categories showed reductions in risk for men in the highest intake categories for garlic (OR = 0.47, 95% CI = 0.31 to 0.71; P(trend)<.001) and scallions (OR = 0.30, 95% CI = 0.18 to 0.51; P(trend)<.001). The reduced risk of prostate cancer associated with allium vegetables was independent of body size, intake of other foods, and total calorie intake and was more pronounced for men with localized than with advanced prostate cancer.

PMID: 12419792 [PubMed - indexed for MEDLINE]


[Metabolic effects and drug interactions provoked by certain vegetables: grapefruit, St. John's wort and garlic]

[Article in French]

Neuman M.

GRAPEFRUIT: Essentially consumed in the form of juices with its bitterness helping to quench thirst, grapefruit contains not only vitamin C but also many complex antioxidants, lycopene, lemonoids and naringine. It also contains large quantities of pectin. Grapefruit juice is a metabolic inhibitor of medicinal substances that constitute an exclusive target for the CYP 3A4 isozyme and glycoprotein P in the enterocytes. Above all, it affects the drugs with strong intestinal metabolic first pass effect, phenomenon provoking the reduction of...
their oral bioavailability. This metabolic inhibition is manifested by an increase in the serum levels, oral bioavailability and therapeutic activity of drugs metabolized by CYP 3A4, a characteristic that may indeed be interesting for some of them, but which should be avoided for others. ST. JOHN'S WORT: (Hypericum perforatum) Also known as "herbe a mille trous" or "herbe perceee" or even "herbe de Saint-Jean" in France, St. John's wort is used in several therapeutic fields: neuropsychiatry, dermatology (oleate or lipid extract) and in rheumatology. In herbal remedies and homeopathy, the flower heads are often prescribed as antidepressor in the treatment of mild to moderate depression. It also contains photosensitizing substances, which, at high dose, or during chronic use, may provoke intense dermatitis or photosensitivity. The potential occurrence of side effects with its use has led the European Agency for drug assessment and the French Medicines Agency to decree that all magistral preparations containing St. John's wort must be labeled: "Warning, risk of drug interactions".

GARLIC: (Allium salivum) Originating from Asia, widespread and cultivated in Europe in kitchen gardens, garlic is used by herbalists for its diuretic, antiseptic, stimulating and sudorific properties.

PMID: 12378978 [PubMed - indexed for MEDLINE]
Critical role of allyl groups and disulfide chain in induction of Pi class glutathione transferase in mouse tissues in vivo by diallyl disulfide, a naturally occurring chemopreventive agent in garlic.

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We have shown previously that the chemoprotective activity of diallyl disulfide (DADS), a naturally occurring anticancer agent in garlic, against benzo[a]pyrene (BP)-induced forestomach carcinogenesis in mice correlates strongly with its inductive effects on the expression of Pi class glutathione (GSH) transferase mGSTP1-1. The present structure-activity relationship studies were designed to define the role of allyl groups and the disulfide chain in mGSTP1-inducing activity of DADS. Hepatic mGSTP1 mRNA levels rose rapidly upon treatment of mice with DADS, reached a maximum between 12 and 24 h (< or =5.7-fold induction) and fell to control levels by 48 h after DADS treatment. Induction of mGSTP1 mRNA in the forestomach was maximal between 6 and 12 h after DADS treatment (< or =4.7-fold induction). The mGSTP1 mRNA expression was either unaltered (liver) or moderately increased (forestomach) upon treatment of mice with dipropyl disulfide (DPDS), which is a naturally occurring saturated analog of DADS. These results indicated that the allyl groups are critical for the mGSTP1-inducing activity of DADS. A statistically significant increase in the expression of mGSTP1 mRNA was also observed in the liver and forestomach of mice treated with diallyl monosulfide (DAMS), albeit to a much lesser extent compared with DADS. These results indicated that the oligosulfide chain length in garlic organosulfides (OSC) is equally important for their mGSTP1-inducing activity. The role of the disulfide chain in DADS-mediated induction of mGSTP1 was further investigated by testing a pair of alkadienes (1,7-octadiene and 1,8-nonadiene) having structural similarity to DADS. Both DADS and the alkadienes carry allyl groups at both ends of a linear molecule and the distance between the allylic carbon atoms is similar in both compounds, but the central disulfide chain of DADS is replaced with an alkyl chain in the alkadienes. The alkadienes were either ineffective or moderately active in increasing mGSTP1 expression. In conclusion, the results of the present study clearly indicate that the presence of terminal allyl groups as well as the central disulfide chain is required for maximum induction of mGSTP1 in vivo by garlic-derived OSCs.

PMID: 12376475 [PubMed - indexed for MEDLINE]
Ugeskr Laeger. 2002 Sep 2;164(36):4161-5.
[Herbal medicines--evidence and drug interactions in clinical practice]

[Article in Danish]
Kistorp TK, Laursen SB.

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We present an evidence-based literature review of five commonly used herbs in Denmark: St John's wort, ginkgo biloba, valerian, garlic, and ginseng. Various drug interactions are associated with the intake of some herbal medicines, and may result in many clinical conditions. We bring this to the attention of clinical practitioners. Attention to clinical practice and recommendations for discontinuation of the five herbs are given before surgery. Physicians should be aware of and report potential drug interactions and adverse effects, so as to throw more light on this subject.

Publication Types:
• Review
• Review, Tutorial

PMID: 12362826 [PubMed - indexed for MEDLINE]


[The status of herbal antilipemic agents]

[Article in German]
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A favourable effect on serum lipids may be achieved with herbal medicinal products, if they are administered at sufficient high dosages and sufficient long term use. Their efficacy is not so strong than that documented for chemically defined products, however their tolerability is superior. Maximal effects are more than that of a strong lipid lowering diet, however, lipid lowering herbal drugs are Allium sativum L., Cynara scolymus L., Curcumae longa L. All of them exert some more beneficial effects, which suggest to be an advantageous alternative for patients. This contribution gives a brief review and an assessment of the suitability of herbal medicinal preparations for the prophylactic or therapeutic treatment of hyperlipidemia and atherosclerosis.

Publication Types:
• Review
• Review, Tutorial

PMID: 12244889 [PubMed - indexed for MEDLINE]


Effects of garlic components diallyl sulfide and diallyl disulfide on arylamine N-acetyltransferase activity and 2-aminofluorene-DNA adducts in human promyelocytic leukemia cells.

Lin JG, Chen GW, Su CC, Hung CF, Yang CC, Lee JH, Chung JG.

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Two components of garlic, diallyl sulfide (DAS) and diallyl disulfide (DADS), inhibited arylamine N-acetyltransferase (NAT) activity and 2-aminofluorene-DNA adduct in human promyelocytic leukemia cells (HL-60). The NAT activity was measured by high performance liquid chromatography assaying for amounts of N-acetyl-2-aminofluorene (2-AAF) and remaining 2-aminofluorene (2-AF). Cellular cytosols and intact cell suspensions were assayed. The inhibition of NAT activity and 2-AF-DNA adduct formation in human leukemia cells by DAS and DADS were dose-dependent and were directly proportional. The data also indicated that DAS and DADS decrease the apparent values of Km and Vmax from human leukemia cells in both assays. This is the first report of garlic components affecting human leukemia cell NAT activity and 2-AF-DNA adduct formation.

PMID: 12230020 [PubMed - indexed for MEDLINE]


[Study on trace elements in epithelial cells during oral carcinogenesis prevented by garlic]

[Article in Chinese]

Tang ZG, Xu XP, Shen ZH.

Department of Oral and Maxillofacial Surgery, Xiangya Hospital.

Sixty-two Wistar rats were divided randomly into two groups, thirty-one for each group. The posterior hard palatal mucosae of all animals were painted thrice weekly with 0.5% 4-nitroquinoline 1-oxide (dissolved in dimethyl sulfoxide). Before that, the garlic injection solution and the distilled water were painted at the same place of the experimental and control group animals, respectively. All animals were killed in turn from the beginning of the experiment at random at the 10th, 13th, and 19th week. Then, trace elements of intranuclear and cytoplasm of epithelial cells or cancer cells at the mentioned weeks were surveyed by electron probe microanalysis. The results were that garlic decreased the levels of intranuclear and cytoplasm copper (P < 0.05); the levels of intranuclear and cytoplasm selenium at the 10th week and the 13th week (P < 0.05) and those of zinc at the 19th week (P < 0.01) increased. So, garlic inhibits oral carcinogenesis by changing concentrations of intranuclear and cytoplasm trace elements that is copper, zinc, selenium, and the ratio of the three elements.

PMID: 12212239 [PubMed - indexed for MEDLINE]


[The electron probe microanalysis on oral precancer treated by garlic]

[Article in Chinese]

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Department of Oral and Maxillofacial Surgery, Xiangya Hospital.

OBJECTIVE: To evaluate the effect of 4 kinds of trace elements on experimental oral precancer treated by garlic. METHODS: The palatal mucosae of 42 Wistar rats were painted with 0.5% of 4-nitroquinoline-1-oxide (4NQO) three times weekly for 7 weeks by coating method. Then the animals were divided randomly into two groups. The treatment group was treated three times weekly with garlic solution at the posterior hard palatal mucosae by coating method, and in the control group, the vehicle-distilled water was used instead of garlic solution. At the 5th and 8th weeks of the treatment
and the 7th week after the treatment was stopped, some animals were killed. The palatal epithelial cells were prepared and surveyed by electron probe microanalysis. RESULTS: During the treating period, garlic improved the levels of epithelial cells' nuclei copper, selenium, molybdenum and extranuclei selenium, molybdenum (P < 0.01), but it decreased the contents of epithelial cells' extranuclei copper and extra- and intranuclei zinc (P < 0.01). CONCLUSIONS: Garlic can treat the oral precancer by improving the levels of epithelial cells' nuclei copper, selenium, and molybdenum and extranuclei selenium and molybdenum.

PMID: 12212149 [PubMed - indexed for MEDLINE]

Anaesthesia. 2002 Sep;57(9):889-99.

Comment in:
• Anaesthesia. 2003 Feb;58(2):184-5.

The peri-operative implications of herbal medicines.

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An increasing number of patients are taking herbal medicines such as echinacea, garlic, ginkgo biloba, ginseng, St John's Wort, valerian, ephedra, kava, grapefruit juice and ginger. Although these herbal medications are considered 'natural' products that may have some benefits, adverse effects such as increased bleeding tendencies and drug interactions are associated with their use. Surgeons and anaesthetists may be unaware of their patients' use of these medications because it is common for patients not to disclose their use of this form of medication, and both surgeons and anaesthetists often fail to enquire about their use. Anaesthetists and surgeons must be familiar with the effects of herbal medicines and should specifically enquire about the use of herbal medicines during pre-operative assessment. Currently available data suggest that all herbal medicines should be ceased 2 weeks before surgery.

Publication Types:
• Review
• Review, Tutorial

PMID: 12190754 [PubMed - indexed for MEDLINE]

[Pharmaceutical importance of Allium sativum L. 3. Antibacterial effects on Helicobacter pylori]

[Article in Czech]

Sovova M, Sova P, Mrazova A.

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The paper points out the risk factors which render possible the outbreak of infections due to the bacterium Helicobacter pylori manifesting itself as chronic gastritis. In a great extent it results in peptic and duodenal ulcers and can even lead to the development of adenocarcinoma and lymphoma of the stomach. The paper mentions the efficacy of previous and contemporary therapy.
Possible use of garlic in the treatment of these infections is intensively investigated. At present mainly in vitro experiments showing promising results are performed. A minimum of experiments carried out with out-patients produced negative results. As they do not fulfill the parameters of clinical experiments, this question still remains open.

Publication Types:
• Review
• Review, Tutorial

PMID: 12183902 [PubMed - indexed for MEDLINE]


Garlic induces apoptosis during 7,12-dimethylbenz[a]anthracene-induced hamster buccal pouch carcinogenesis.

Balasenthil S, Rao KS, Nagini S.

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The apoptosis-inducing capacity of aqueous garlic extract during 7,12-dimethylbenz[a]anthracene-induced hamster buccal pouch (HBP) carcinogenesis was investigated in male Syrian hamsters using DNA fragmentation and the apoptosis-associated proteins, tissue transglutaminase (tTG) and Bcl-2. Hamsters were divided into four groups of six animals each. Animals in group 1 were painted with a 0.5% solution of DMBA in liquid paraffin on the right buccal pouches three times a week for 14 weeks. Group 2 animals painted with DMBA as in group 1, in addition received 250 mg/kg body weight aqueous garlic extract orally on days alternate to DMBA application. Group 3 animals received garlic extract as in group 2. Group 4 animals received neither DMBA nor garlic extract and served as the control. The experiment was terminated at the end of 14 weeks. Administration of aqueous garlic extract (250 mg/kg body weight) to animals painted with DMBA inhibited DMBA-induced oral carcinogenesis as revealed by the absence of neoplasms, induction of tTG and inhibition of Bcl-2 expression. The results of the present study suggest that garlic may exert its chemopreventive effect by inducing apoptosis.

PMID: 12110336 [PubMed - indexed for MEDLINE]


Medicinal plants of India with anti-diabetic potential.

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Since ancient times, plants have been an exemplary source of medicine. Ayurveda and other Indian literature mention the use of plants in treatment of various human ailments. India has about 45000 plant species and among them, several thousands have been claimed to possess medicinal properties. Research conducted in last few decades on plants mentioned in ancient literature or used traditionally for diabetes have shown anti-diabetic property. The present paper reviews 45 such plants and their products (active, natural principles and crude extracts) that have been mentioned/used in the Indian traditional system of medicine and have shown experimental or clinical anti-diabetic activity. Indian plants which are most effective and the most commonly studied in relation to diabetes and their complications are: Allium cepa, Allium sativum, Aloe vera, Cajanus cajan, Coccinia indica, Caesalpinia...
bonduccella, Ficus bengalenesis, Gymnema sylvestre, Momordica charantia, Ocimum sanctum, Pterocarpus marsupium, Swertia chirayita, Syzygium cumini, Tinospora cordifolia and Trigonella foenum graecum. Among these we have evaluated M. charantia, Eugenia jambolana, Mucuna pruriens, T. cordifolia, T. foenum graecum, O. sanctum, P. marsupium, Murraya koeingii and Brassica juncea. All plants have shown varying degree of hypoglycemic and anti-hyperglycemic activity.

Publication Types:
• Review
• Review, Academic

PMID: 12020931 [PubMed - indexed for MEDLINE]


[Hypotensive effect of long-acting garlic tablets allicor (a double-blind placebo-controlled trial)]

[Article in Russian]

Andrianova IV, Fomchenkov IV, Orekhov AN.

AIM: To evaluate a hypotensive action of long-acting garlic powder tablets allicor in patients with mild or moderate hypertension and to compare allicor effects with those of foreign analog--kwai garlic tablets. MATERIAL AND METHODS: A double-blind, randomized and placebo-controlled study enrolled 85 patients with mild or moderate hypertension. The patients were divided into 4 groups: group 1 received allicor in a dose 600 mg/day, group 2--2400 mg/day, group 3--kwai in a dose 900 mg/day, group 4--placebo. RESULTS: Allicor produced reaction in both systolic and diastolic pressure. An increase of allicor daily dose to 2400 mg does not provide an additional hypotensive effect. Kwai results in only systolic but not diastolic arterial pressure lowering. CONCLUSION: Allicor is more effective than kwai in reduction of diastolic blood pressure. It can be recommended as a hypotensive treatment in mild and moderate arterial hypertension.

Publication Types:
• Clinical Trial
• Randomized Controlled Trial

PMID: 11980131 [PubMed - indexed for MEDLINE]


Prevention of psychological stress-induced immune suppression by aged garlic extract.

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We determined the effect of Aged Garlic Extract (AGE) on damage caused to immune function by a psychological stress using a communication box. After four days of a psychological stress, a decrease in spleen weight and spleen cells was observed in the psychological stress-exposed mice as compared normal mice (non-stress). AGE significantly prevented the decreases in spleen weight and cells. Additionally, AGE significantly prevented the reduction of hemolytic plaque-forming-cells in spleen cells and anti-SRBC antibody titer in serum caused by this psychological stress. Moreover, a reduction in NK activities was observed in the psychological stress-exposed mice as compared
with normal mice (non-stress), whereas NK activities in the AGE administered mice were almost the same as normal mice (non-stress). These results indicate that psychological stress qualitatively and quantitatively impairs immune function, and that AGE is extremely useful for preventing psychologically-induced damage.

PMID: 11962538 [PubMed - indexed for MEDLINE]


Garlic and its active metabolite allicin produce endothelium- and nitric oxide-dependent relaxation in rat pulmonary arteries.

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1. The aims of the present study were to investigate the effects of fresh garlic and one of its active metabolites, allicin, on rat isolated pulmonary arteries (RPA). 2. In endothelium-intact and phenylephrine-precontracted RPA, the addition of a water or a 5% ethanol extract of fresh garlic (1-500 microg/mL) resulted in a dose-dependent relaxation reaching a maximum (mean +/- SEM) of -91 +/- 3 and -93 +/- 2%, respectively, with an ED(50) of 113 +/- 12 and 106 +/- 10 microg/mL, respectively. The vasorelaxation was readily reversible upon washing and no tachyphylaxis was noted. 3. An extract of the external garlic storage leaf produced a significantly greater relaxation than the inner stem. Microfiltration of extracts with a 10,000 molecular sieve did not attenuate relaxation. Inactivation of alliinase and allicin formation, with either boiling of the garlic clove for 30 min or 100% ethanol treatment, completely abolished relaxation. In contrast, similar treatment of crushed garlic with formed allicin retained the relaxation response. 4. Pure allicin produced a similar relaxation as garlic extract, with an EC(50) of approximately 0.8 microg/mL. Disruption of endothelium or N(G)-nitro-L-arginine methyl ester pretreatment attenuated the relaxation, whereas indomethacin had no effect. 5. Prior garlic (500 microg/mL) treatment enhanced acetylcholine relaxation by shifting the response curve to the left, but had no effect on nitric oxide (NO) donor-induced responses. 6. These results demonstrate that garlic and the active metabolite allicin are capable of eliciting a NO-dependent relaxation in RPA and that this response is likely to be mediated via garlic activation of NO formation rather than its stabilization.

PMID: 11906464 [PubMed - indexed for MEDLINE]


Altered cytokeratin expression during chemoprevention of experimental hamster buccal pouch carcinogenesis by garlic.

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BACKGROUND: Cytokeratins (also known as keratins (K)) are members of the family of intermediate filaments and form major components of the mammalian epithelial cell cytoskeleton. Cytokeratins have emerged as reliable cellular markers of oral cancer development and chemoprevention because of their abundance, stability and high antigenicity. METHODS: We investigated the effect of aqueous garlic extract on cytokeratin expression during 7,12-dimethylbenz[a]anthracene (DMBA)-induced hamster buccal pouch (HBP) carcinogenesis. Hamsters were divided into four groups of six animals. Animals in group 1 were painted with a 0.5% solution of DMBA in liquid paraffin, on the right buccal pouches, three times a week for 14 weeks. Group 2 animals were
painted with DMBA as in group 1 and also received 250 mg/kg body weight aqueous garlic extract orally on alternate days to the DMBA application. Group 3 animals received garlic extract only, as in group 2. Group 4 animals received neither DMBA nor garlic extract and served as the control. The hamsters were killed after an experimental period of 14 weeks. RESULTS: Cytokeratin expression was studied using human monoclonal antibodies AE1 and AE3, which react with type I and II keratins. In DMBA-induced squamous cell carcinomas, decreased expression of high molecular weight keratins was observed. Administration of garlic extract to animals painted with DMBA suppressed HBP carcinomas and restored normal cytokeratin expression. CONCLUSION: The results of the present study suggest that inhibition of HBP carcinogenesis by garlic may be due to its regulatory effects on differentiation, tumour invasiveness, migratory and metastatic potential. We suggest that one of the mechanisms of tumour inhibition by garlic is an influence on cellular differentiation.

PMID: 11903819 [PubMed - indexed for MEDLINE]


Garlic supplements can impede HIV medication.

[No authors listed]

Publication Types:
• News

PMID: 11848645 [PubMed - indexed for MEDLINE]


[Use of allikor for the normalization of fibrinolysis and hemostasis in patients with chronic cerebrovascular diseases]

[Article in Russian]

Andrianova IV, Ionova VG, Demina EG, Shabalina AA, Karabasova IaA, Liutova Li, Povorinskaia TE, Orekhov AN.

A new form of garlic preparation—long-acting tablets of garlic powder allikor has been studied in patients with cerebral atherosclerosis (CA) complicated by chronic cerebrovascular pathology. A double blind placebo-controlled trial examined allikor effects on hemostasis and fibrinolysis in cross-over groups at two stages. At the first stage patients of group 1 (n = 15) received allikor in a dose 600 mg/day; patients of group 2 (n = 14) were given placebo. At the second stage group 1 received place and group 2 allikor in the same regimen. Before the treatment allikor effects on platelet aggregation and fibrinolysis were studied in vitro (20 patients). Allikor significantly inhibited ADP-induced platelet aggregation in vitro and ex vivo, reduced blood fibrinogen, normalized initially low fibrinolytic activity and fibrinolysis index. Due to the above properties allikor can be used for prevention and treatment of CA complicated by chronic cerebrovascular pathology.

Publication Types:
• Clinical Trial
• Randomized Controlled Trial

PMID: 11811113 [PubMed - indexed for MEDLINE]

Drugs. 2001;61(15):2163-75.

Interactions between herbal medicines and prescribed drugs: a systematic review.
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Despite the widespread use of herbal medicines, documented herb-drug interactions are sparse. We have reviewed the literature to determine the possible interactions between the seven top-selling herbal medicines (ginkgo, St John's wort, ginseng, garlic, echinacea, saw palmetto and kava) and prescribed drugs. Literature searches were performed using the following databases: Medline (via Pubmed), Cochrane Library, Embase and phytobase (all from their inception to July 2000). All data relating to herb-drug interactions were included regardless of whether they were based on case reports, case series, clinical trials or other types of investigation in humans. In vitro experiments were excluded. Data were extracted by the first author and validated by the second author. 41 case reports or case series and 17 clinical trials were identified. The results indicate that St John's wort (Hypericum perforatum) lowers blood concentrations of cyclosporin, amitriptyline, digoxin, indinavir, warfarin, phenprocoumon and theophylline; furthermore it causes intermenstrual bleeding, delirium or mild serotonin syndrome, respectively, when used concomitantly with oral contraceptives (ethinylestradiol/desogestrel), loperamide or selective serotonin-reuptake inhibitors (sertaline, paroxetine, nefazodone). Ginkgo (Ginkgo biloba) interactions include bleeding when combined with warfarin, raised blood pressure when combined with a thiazide diuretic and coma when combined with trazodone. Ginseng (Panax ginseng) lowers blood concentrations of alcohol and warfarin, and induces mania if used concomitantly with phenelzine. Garlic (Allium sativum) changes pharmacokinetic variables of paracetamol, decreases blood concentrations of warfarin and produces hypoglycaemia when taken with chlorpropamide. Kava (Piper methysticum) increases 'off' periods in Parkinson patients taking levodopa and can cause a semicomatose state when given concomitantly with alprazolam. No interactions were found for echinacea (Echinacea angustifolia, E. purpurea, E. pallida) and saw palmetto (Serenoa repens). In conclusion, interactions between herbal medicines and synthetic drugs exist and can have serious clinical consequences. Healthcare professionals should ask their patients about the use of herbal products and consider the possibility of herb-drug interactions.

Publication Types:
• Review
• Review, Tutorial

PMID: 11772128 [PubMed - indexed for MEDLINE]


Effects of wild versus cultivated garlic on blood pressure and other parameters in hypertensive rats.

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Two separate studies were performed on hypertensive rats to assess the effects of wild, uncultivated garlic on elevated systolic blood pressure (SBP) and other cardiovascular parameters. Also, effects of wild garlic and cultivated garlic preparations were compared and the mechanisms behind pressure-lowering abilities of different garlic preparations were examined. The initial study determined that wild garlic lowers blood pressure. In the second study, cardiovascular effects of three different concentrations of wild garlic and two
different cultivated garlics, i.e., a preparation low in allicin and one high in allicin, were compared. All three garlic preparations decreased SBP significantly. Wild garlic produced the greatest pressure-lowering effects, and the least pressure-lowering effects were seen with low-allicin garlic. Compared with control rats, circulating angiotensin II levels were significantly lower in all garlic-eating rats. Losartan decreased blood pressure significantly less and Nω-nitro-L arginine methyl ester hydrochloride (LNAME) increased blood pressure significantly more in garlic-eating rats than in control rats, suggesting that the renin-angiotensin system (RAS) was less active and the nitric oxide system more active in garlic-consuming hypertensive rats. Accordingly, different garlic preparations, especially wild garlic, favorably influenced high SBP in hypertensive rats. These results suggest that both the RAS and the nitric oxide system are involved in the antihypertensive effects of garlic in hypertensive rats.

PMID: 11728237 [PubMed - indexed for MEDLINE]

A pilot study to determine the effectiveness of garlic oil capsules in the treatment of dyspeptic patients with Helicobacter pylori.

McNulty CA, Wilson MP, Havinga W, Johnston B, O’Gara EA, Maslin DJ.
Public Health Laboratory, Gloucestershire Royal Hospital, Gloucester, UK.

BACKGROUND: Resistance of Helicobacter pylori to clarithromycin and metronidazole is now found worldwide. Steam-distilled garlic oil has in vitro activity against H. pylori and may be a useful alternative treatment strategy.

MATERIALS AND METHODS: In this pilot study dyspeptic patients with positive serology for H. pylori confirmed by 13C urea breath test (UBT), at 0 and 2 weeks, were enrolled. Treatment consisted of one 4 mg garlic oil capsule with a meal four times per day for 14 days. H. pylori eradication was defined as a negative UBT at both follow-up appointments. Suppression was defined as a 50% fall in 13C excess between baseline and follow-up 1. RESULTS: Five patients completed the study. There was no evidence of either eradication or suppression of H. pylori or symptom improvement whilst taking garlic oil.

CONCLUSION: These negative results show that, within the gastric milieu, garlic oil at this dose does not inhibit H. pylori. A higher dose administered for a longer time-period may be effective. Antibiotics are usually combined with a proton-pump inhibitor or bismuth salt, as the only antibiotic with any in vivo activity against H. pylori in monotherapy is clarithromycin. A proton pump inhibitor raises gastric pH and, by increasing bacterial division, may increase the in vivo activity of garlic oil. This may be worth pursuing in a future trial.

Publication Types:
• Clinical Trial

PMID: 11683929 [PubMed - indexed for MEDLINE]

Heart lines. Garlic’s modest effects on cholesterol.

[No authors listed]

Publication Types:
• News

PMID: 11546616 [PubMed - indexed for MEDLINE]


Efficacy of naturopathic extracts in the management of ear pain associated with acute otitis media.
Sarrell EM, Mandelberg A, Cohen HA.

Objective: To determine the efficacy and tolerance of Otikon Otic Solution (Healthy-On Ltd, Petach-Tikva, Israel), a naturopathic herbal extract (containing Allium sativum, Verbascum thapsus, Calendula flores, and Hypericum perforatum in olive oil), compared with Anaesthetic (Vitamed Pharmaceutical Ltd, Benyamina, Israel) ear drops (containing ametocaine and phenazone in glycerin) in the management of ear pain associated with acute otitis media (AOM). Design: Children between the ages of 6 and 18 years who experienced ear pain (otalgia) and who were diagnosed with eardrum problems associated with AOM were randomly assigned to be treated with Otikon or Anaesthetic ear drops, which were instilled into the external canal(s) of the affected ear(s). Ear pain was assessed using 2 visual analog scales: a linear scale and a color scale. Pain assessment took place throughout the course of 3 days. The mean score of pain reduction was used to measure outcome. Setting: Primary pediatric community ambulatory centers. Participants: One hundred three children aged 6 to 18 years who were diagnosed with otalgia associated with AOM. Results: Each of the 2 treatment groups were comparable on the basis of age, sex, laterality of AOM, and the effectiveness of ameliorating symptoms of otalgia. The 2 groups were also comparable to each other in the initial ear pain score and in the scores at each application of Otikon or Anaesthetic drops. There was a statistically significant improvement in ear pain score throughout the course of the study period (p = .007). Conclusions: Otikon, an ear drop formulation of naturopathic origin, is as effective as Anaesthetic ear drops and was proven appropriate for the management of AOM-associated ear pain.

Publication Types:
• Clinical Trial
• Randomized Controlled Trial

PMID: 11434846 [PubMed - indexed for MEDLINE]


Mechanisms by which garlic and allyl sulfur compounds suppress carcinogen bioactivation. Garlic and carcinogenesis.

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Overall, a host of studies provides compelling evidence that garlic and its organic allyl sulfur components are effective inhibitors of the cancer process. These studies reveal that the benefits of garlic are not limited to a specific species, to a particular tissue, or to a specific carcinogen. Several mechanisms are likely to account for this protection. Notable among these is a depression in nitrosamine formation and a reduction in carcinogen bioactivation. The benefits provided by garlic must be viewed as part of the entire diet, since several dietary constituents can influence the degree of protection. More than one compound is responsible for the anticancer properties associated with garlic. Future research should focus on how genetic variability and daily environmental factors influence the anticancer benefits attributed to garlic and its allyl sulfur components.
Efficacy of garlic supplementation in lowering serum cholesterol levels.

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Previous studies using garlic have found alterations on a number of cardiovascular disease (CVD) risk factors including blood pressure, plasma viscosity, platelet activity, and serum lipid levels. The latest clinical research suggests that consumption of garlic powder does not play a significant role in lowering plasma lipid levels when in conjunction with a low-fat, low-cholesterol diet. Additional well-controlled, long-term studies that explore dosage and preparation type are necessary to confirm the efficacy of garlic in lowering cholesterol levels and to fully understand garlic's potential role in CVD.

Effect of garlic (Allium sativum L.) extract on tissue lead level in rats.

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The prophylactic efficacy of garlic (Allium sativum L.) extract to reduce tissue lead (Pb) concentration was evaluated experimentally in rats. Thirty female rats were divided into five groups, keeping group A as a healthy control. Rats of groups B, C, D and E received lead acetate orally at the rate of 5 mg per kg body weight daily for 6 weeks. The garlic extract was tried in three doses, viz. 100 (low), 200 (medium) and 400 mg (high) per kg body weight orally and given simultaneously with lead salt to the rats of group C, D and E, respectively. Mean blood lead concentrations in lead-exposed rats ranged between 0.13+/−0.02 and 0.96+/−0.06 microg/ml, whereas in garlic-treated rats, the range was between 0.16+/−0.01 and 0.80+/−0.05; 0.13+/−0.01 and 0.71+/−0.06 and 0.14+/−0.01 and 0.60+/−0.05 microg per ml in low, medium and high dose groups, respectively. The mean lead concentration in liver, kidneys, brain and bone of lead exposed rats was 2.943+/−0.206, 4.780+/−0.609, 1.019+/−0.100 and 44.075+/−2.60 microg per ml, respectively. Concomitant use of garlic extract at the three different doses was found to reduce lead concentration considerably indicating the potential therapeutic activity of garlic against lead.

Herbal medicines and perioperative care.

Comment in:

• JAMA. 2001 Nov 28;286(20):2542-3; author reply 2543-4.
• JAMA. 2001 Nov 28;286(20):2542; author reply 2543-4.
Ang-Lee MK, Moss J, Yuan CS.

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CONTEXT: Widespread use of herbal medications among the presurgical population may have a negative impact on perioperative patient care. OBJECTIVES: To review the literature on commonly used herbal medications in the context of the perioperative period and provide rational strategies for managing their preoperative use. DATA SOURCES: The MEDLINE and Cochrane Collaboration databases were searched for articles published between January 1966 and December 2000 using the search terms herbal medicine, phytotherapy, and alternative medicine and the names of the 16 most commonly used herbal medications. Additional data sources were obtained from manual searches of recent journal articles and textbooks. STUDY SELECTION: We selected studies, case reports, and reviews addressing the safety and pharmacology of 8 commonly used herbal medications for which safety information pertinent to the perioperative period was available. DATA EXTRACTION: We extracted safety, pharmacodynamic, and pharmacokinetic information from the selected literature and reached consensus about any discrepancies. DATA SYNTHESIS: Echinacea, ephedra, garlic, ginkgo, ginseng, kava, St John's wort, and valerian are commonly used herbal medications that may pose a concern during the perioperative period. Complications can arise from these herbs' direct and pharmacodynamic or pharmacokinetic effects. Direct effects include bleeding from garlic, ginkgo, and ginseng; cardiovascular instability from ephedra; and hypoglycemia from ginseng. Pharmacodynamic herb-drug interactions include potentiation of the sedative effect of anesthetics by kava and valerian. Pharmacokinetic herb-drug interactions include increased metabolism of many drugs used in the perioperative period by St John's wort. CONCLUSIONS: During the preoperative evaluation, physicians should explicitly elicit and document a history of herbal medication use. Physicians should be familiar with the potential perioperative effects of the commonly used herbal medications to prevent, recognize, and treat potentially serious problems associated with their use and discontinuation.

Publication Types:
• Review
• Review, Tutorial

PMID: 11448284 [PubMed - indexed for MEDLINE]


Comment on:

Garlic for total cholesterol reduction.

Lawson LD.

Publication Types:
• Comment
• Letter

PMID: 11434747 [PubMed - indexed for MEDLINE]


An intervention trial to inhibit the progression of precancerous gastric lesions: compliance, serum micronutrients and S-allyl cysteine levels, and toxicity.
Gastric cancer is the second most frequent cause of death from cancer in the world and the leading cause of death from cancer in China. In September 1995, we launched a randomized multi-intervention trial to inhibit the progression of precancerous gastric lesions in Linqu County, Shandong Province, an area of China with one of the world's highest rates of gastric cancer. Treatment compliance was measured by pill counts and quarterly serum concentrations of vitamin C, vitamin E and S-allyl cysteine. In 1999, toxicity information was collected from each trial participant to evaluate treatment-related side-effects during the trial. Compliance rates were 93% and 92.9% for 39 months of treatment with the vitamins/mineral and garlic preparation, respectively. The means for serum concentrations of vitamins C and E were 7.2 microg/ml and 1695 microg/dl among subjects in the active treatment groups compared with 3.1 microg/ml and 752 microg/dl among subjects in the placebo treatment group, respectively. No significant differences in side-effects were observed between the placebo treatment group and the vitamins/mineral and garlic preparation treatment groups during the 39-month trial period.

Publication Types:
• Clinical Trial
• Randomized Controlled Trial

PMID: 11432713 [PubMed - indexed for MEDLINE]

Diallyl sulfide--a flavour component from garlic (Allium sativum) attenuates lipid peroxidation in mice infected with Trichinella spiralis.

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We investigated the antioxidant capacity of diallyl sulfide (DAS) in the course of experimental trichinellosis in C3H mice. For this purpose, the mice were orally infected with either Trichinella spiralis larvae (300 larvae/mouse) or treated per os with normal saline (control), and 12 hrs later, they were treated per os with DAS (200 mg/kg b.w) daily for 5 or 20 days. On day 5 and 35 of the post-infection period (5 and 35 dpi), thiobarbituric-acid reactive substances (TBARS) in the small intestinal mucosa and diaphragm samples and the total antioxidant status (TAS) of blood were determined. Trichinella spiralis increased TBARS and decreased TAS in the intestinal phase of invasion. However, in the muscular phase mice, neither TBARS nor TAS was found to be different from those of the control. Diallyl sulfide has been shown to decrease TBARS and the agent did not have any effect(s) on the total antioxidant status of blood in Trichinella-infected mice. The results suggest that diallyl sulfide may be an effective antioxidant candidate and may therefore play a significant role in the defense against lipid peroxidation in trichinellosis.

PMID: 11417909 [PubMed - indexed for MEDLINE]

[Review: cardiovascular effect of garlic (Allium sativum)]
[Article in Spanish]
Garcia Gomez LJ, Sanchez-Muniz FJ.

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Garlic has been used for centuries, and even nowadays is part of popular medicine in many cultures. New data have increased the interest in garlic and its role in normalization and treatment of cardiovascular disease risk factors. Recent studies have shown the complex composition of garlic, containing many compounds, that present potential positive effect in the field of health. The aim of the present paper was to review results of some studies that have found a relationship between garlic and cardiovascular diseases. From some of them it can be summarized that garlic can normalize plasma lipid, check lipid peroxidation, stimulate fibrinolytic activity, inhibit platelet aggregation, smooth the thickening and structural changes of artery wall related to aging and atherosclerosis, and decrease blood pressure. However, some other studies do not support these benefits. The positive effects found have promoted many study projects, nevertheless, the extract lability and the lack of result consensus call for a moderate consumption of garlic and garlic extracts. The composition variation due to gathering and aging together with the changes occurring in canning and industrial treatment makes necessary the application of some norms in the production and consumption of this functional food in order to guarantee its use in adequate form and doses.

Publication Types:
• Review
• Review, Tutorial

PMID: 11347290 [PubMed - indexed for MEDLINE]


Allium sativum potentiates suicide gene therapy for murine transitional cell carcinoma.

Moon DG, Cheon J, Yoon DH, Park HS, Kim HK, Kim JJ, Koh SK.

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This study evaluated the synergistic effect of Allium sativum (AS) with suicide gene therapy for transitional cell carcinoma (TCC) of the bladder. Subcutaneous TCCs were established in syngeneic C3H/He mice with 1 x 10(5) MBT-2 cells. AS liquid extract was injected at the site of tumor transplantation on Day 1 for three weeks (Experiment I) and into the established tumors weekly for five weeks (Experiment II) in combination with or without gene therapy using a replication-defective adenoviral vector containing a herpes simplex virus thymidine kinase (HSV-TK) gene under the transcriptional control of Rous sarcoma virus (RSV) promoter (Ad-RSV-TK, 5 x 10(8) plaque-forming units) plus ganciclovir (20 mg/kg/day i.p.). AS demonstrated a statistically significant reduction in incidence of TCC (cumulative dose 25 mg of AS). Combination AS-suicide gene therapy significantly inhibited the tumor growth compared with the controls, which was evidenced by apoptosis on histomorphological and immunohistochemical studies. These results suggest that AS had a definite antitumor effect in inhibiting tumorigenesis and growth of TCC in a murine model. AS treatment combined with suicide gene therapy had significant additive antitumor effects on TCC and may provide a novel and effective treatment modality for TCC of the bladder.

PMID: 11341051 [PubMed - indexed for MEDLINE]


Garlic prevents ultrastructural alterations caused by dehydration in mouse
cerebral microvessels.

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Dehydration is known to significantly reduce both the time required for the first platelet aggregate and the time to full occlusion in photochemically-induced thrombosis, in vivo. Ultrastructural changes that contribute to such events remain unknown. Therefore, the effect of water deprivation for 24 hr, (as a model for dehydration) on the ultrastructure of mouse pial microvessels was investigated. The possible beneficial effect of garlic in preventing such ultrastructural changes was also investigated. Four groups of TO strain: control, control-garlic treated, dehydrated, and dehydrated-garlic treated male mice, 10/group, were used. Dehydration was induced by water deprivation for 24 hr. Garlic solution was i.p. injected at 0.1 ml/10g body weight. In urethane-anesthetized (2 mg/g, i.p.) mice, topical and transvessel bimodal fixation of pial microvessels was done with a phosphate buffered mixture of glutaraldehyde and paraformaldehyde, followed by a conventional electron microscopy procedure. Examination of control cerebral pial microvessels showed no evidence of cellular damage. Membranes of endothelial cells were intact. Within pial microvessels there was no evidence of platelet aggregation. Garlic treatments did not cause any ultrastructure abnormalities in control mice. Compared with control, dehydration caused the appearance of thrombi that consisted of platelet aggregates. Discoid platelets containing granules, spheroid degranulated platelets, and those with large pseudopodia were present in 80% of dehydrated mice. The venular endothelial surface of dehydrated mice revealed dilated profiles of endoplasmic reticulum and variously shaped vacuoles. Swelling of nuclear envelopes and mitochondrial distortion were also present in dehydrated mice. Concomitant garlic treatment prevented most of these ultrastructural changes. These findings demonstrated the extent of damage to the pial microvessels in response to water deprivation and demonstrated the beneficial effect of garlic as a possible mean of protection against oncoming vascular pathology.

PMID: 11331974 [PubMed - indexed for MEDLINE]


Comment in:

Use of alternative medicines in diabetes mellitus.

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AIMS: Enormous advances have been made in medical care but more people are still using herbal or alternative remedies. In chronic conditions such as diabetes patients may turn to alternative remedies that have been purported to improve glycaemic control. This study surveyed diabetic and control subjects about their use of all prescribed medication, over-the-counter supplements, and alternative medications. METHODS: Subjects were prospectively contacted in person or by telephone. Five hundred and two diabetic subjects and 201 control subjects were asked to provide details about themselves, their diabetes (for the diabetic subjects) and their use of prescribed medication, over-the-counter supplements and alternative medications. Subjects were asked to rank their assessment of the effectiveness of each medication. Costs were calculated on
a per month basis from average prices obtained from five alternative health stores and five chemist shops. RESULTS: Of the diabetic subjects, 78% were taking prescribed medication for their diabetes, 44% were taking over-the-counter supplements and 31% were taking alternative medications. Of the control subjects, 63% were taking prescribed medication, 51% were taking over-the-counter supplements, and 37% were taking alternative medications. Multivitamins, vitamin E, vitamin C, calcium and aspirin were the most commonly used over the counter supplements. Garlic, echinacea, herbal mixtures, glucosamine were the most commonly used alternative medications. Chromium was used only by diabetic subjects and then only rarely. Subjects rated the effectiveness of the alternative medications significantly lower than for prescribed medications but still thought them efficacious. Alternative medications purported to have some hypoglycaemic effect were little used by diabetic subjects. Diabetic subjects spent almost as much money on over-the-counter supplements and alternative medications together as they did on their diabetic medications. CONCLUSIONS: One-third of diabetic patients are taking alternative medications that they consider efficacious but this is no more than in the control group. The money spent on alternative and non-prescription supplements nearly equals that spent on prescription medications. In view of the money spent in this area the time is past due to evaluate these remedies and to establish what merit they have.

PMID: 11318847 [PubMed - indexed for MEDLINE]


Alternative medicine use in HIV-positive men and women: demographics, utilization patterns and health status.

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Between 1995 and 1997, 1,675 HIV-positive men and women using complementary and alternative medicine (CAM) were enrolled into the Bastyr University AIDS Research Center's Alternative Medicine Care Outcomes in AIDS (AMCOA) study. Funded by the National Institutes of Health (NIH) Office of Alternative Medicine (OAM) and National Institute of Allergy and Infectious Diseases (NIAID), the AMCOA study collected information on participant demographics, health status and use of conventional and CAM therapies. Participants from 46 states completed a baseline questionnaire, while additional clinical information (such as CD4 count and HIV-RNA viral load) was obtained from laboratory records. AMCOA participants reported using more than 1,600 different types of CAM therapies (1,210 CAM substances, 282 CAM therapeutic activities and 119 CAM provider types) for treating HIV/AIDS. Approximately two-thirds (63% n = 1,054) of the AMCOA cohort reported using antiretroviral drug therapy (ART) during the six-months previous to completing the baseline questionnaire, while 37% (n = 621) indicated they were not using ART. Of those not using ART, 104 subjects reported never having used any conventional medications for their HIV and 12 subjects used only non-prescription diarrhoea medications. The most frequently reported CAM substances were vitamin C (63%), multiple vitamin and mineral supplements (54%), vitamin E (53%) and garlic (53%). CAM provider types most commonly consulted by the AMCOA cohort were massage therapists (49%), acupuncturists (45%), nutritionists (37%) and psychotherapists (35%). CAM activities most commonly used were aerobic exercise (63%), prayer (58%), massage (53%) and meditation (46%). The choice of CAM therapies among the AMCOA cohort does not appear to be solely based on scientific evidence of efficacy of individual therapies. The majority of AMCOA subjects could be characterized as using integrated medicine, since an overwhelming proportion of the cohort consult with both conventional and CAM providers and use both
conventional and CAM medications, yet few subjects reported that their conventional and CAM providers work as a team. These data and this cohort set the stage for conducting studies of health status changes associated with specific CAM therapies.

PMID: 11304425 [PubMed - indexed for MEDLINE]

Garlic shows promise for improving some cardiovascular risk factors.

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OBJECTIVES: To summarize the effects of garlic on several cardiovascular-related factors and to note its adverse effects. METHODS: English and non-English citations were identified from 11 electronic databases, references, manufacturers, and experts from January 1966 through February 2000 (depending on the database searched). Reports of cardiovascular-related effects were limited to randomized controlled trials lasting at least 4 weeks. Reports of adverse effects were not limited by study design. From 1798 pertinent records, 45 randomized trials and 73 additional studies reporting adverse events were identified. Two physicians abstracted outcomes and assessed adequacy of randomization, blinding, and handling of dropouts. Standardized mean differences of lipid outcomes from placebo-controlled trials were adjusted for baseline differences and pooled using random effects methods. RESULTS: Compared with placebo, garlic preparations may lead to small reductions in the total cholesterol level at 1 month (range of average pooled reductions, 0.03-0.45 mmol/L [1.2-17.3 mg/dL]) and at 3 months (range of average pooled reductions 0.32-0.66 mmol/L [12.4-25.4 mg/dL]), but not at 6 months. Changes in low-density lipoprotein levels and triglyceride levels paralleled total cholesterol level results; no statistically significant changes in high-density lipoprotein levels were observed. Trials also reported significant reductions in platelet aggregation and mixed effects on blood pressure outcomes. No effects on glycemic-related outcomes were found. Proven adverse effects included malodorous breath and body odor. Other unproven effects included flatulence, esophageal and abdominal pain, allergic reactions, and bleeding. CONCLUSIONS: Tri

PMID: 11268223 [PubMed - indexed for MEDLINE]


[Pharmaceutical importance of Allium sativum L. 1. Organic sulfur compounds and their transformation based on present knowledge]

[Article in Czech]

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Katedra farmaceuticke botaniky a ekologie Farmaceuticke fakulty Univerzity Karlovy, Hradec Kralove.
The paper sums up new experimental knowledge concerning the individual groups of organic sulfurous substances of the garlic: sulfoxides, thiosulfinate, ajoens, vinylthiines, alkyl and alken sulfides and glutamylpeptides of sulfurous amino acids, their transformation reactions (based on the temperature, pH, extraction medium, and time) and the final products of transformations (Scheme 1, 2). It deals with the activity of the enzyme alliinase necessary for the transformation of sulfoxides present in the whole garlic, its isolation and stability as well as the stability of the dominant thiosulfinate allicin in various media and simulated body fluids. It refers to the studies of the metabolism and transformations of the most important sulfurous components performed in vitro on the hepatocytes and on the isolated rat liver, and those carried out in vivo on the rats and including the examination of the composition of the exhaled air. It follows from published papers that all different degradation products of thiosulfinates, mainly the prevailing allicin, are carriers of various biological activities. The paper also lists the types of commercial preparations prepared from the garlic, their differences, and considerable variability of their contents of active principles.

Publication Types:
• Review
• Review, Academic

PMID: 11242829 [PubMed - indexed for MEDLINE]

J Nutr. 2001 Mar;131(3s):1106S-8S.
Protection against Helicobacter pylori and other bacterial infections by garlic.
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Louis Pasteur was the first to describe the antibacterial effect of onion and garlic juices. Historically, garlic has been used worldwide to fight bacterial infections. Allium vegetables, particularly garlic (Allium sativum L.) exhibit a broad antibiotic spectrum against both gram-positive and gram-negative bacteria. Noteworthy results published include the following: 1) raw juice of garlic was found to be effective against many common pathogenic bacteria-intestinal bacteria, which are responsible for diarrhea in humans and animals; 2) garlic is effective even against those strains that have become resistant to antibiotics; 3) the combination of garlic with antibiotics leads to partial or total synergism; 4) complete lack of resistance has been observed repeatedly; 5) even toxin production by microorganisms is prevented by garlic. Helicobacter pylori (H. pylori) is a bacterium implicated in the etiology of stomach cancer and ulcers. The incidence of stomach cancer is lower in populations with a high intake of allium vegetables. We have demonstrated in vitro that H. pylori is susceptible to garlic extract at a fairly moderate concentration. Even some antibiotic-resistant H. pylori strains are susceptible to garlic. Clinical trials are necessary to explore the possibility of using garlic as a low-cost remedy for eradicating H. pylori.

Publication Types:
• Review
• Review, Tutorial

PMID: 11238826 [PubMed - indexed for MEDLINE]

J Nutr. 2001 Mar;131(3s):1093S-5S.
Ameliorative effect of S-allylcysteine, a major thioallyl constituent in aged garlic extract, on learning deficits in senescence-accelerated mice.
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This study examined the effect of S-alpha-lipoic acid (SAC), a major thioallyl compound found in aged garlic extract, on the memory deficit and age-related changes of senescence-accelerated mice. Senescence-accelerated prone P8 mice fed a diet supplemented with 40 mg SAC/kg diet for 8 mo had a significantly attenuated decrease in the conditioned avoidance response compared with those not given SAC. In the elevated plus-maze test using senescence-accelerated prone P10 mice, the percentage of time spent on the open arm was greater compared with the senescence-resistant control mice. Chronic dietary treatment with 40 mg SAC/kg diet decreased the time in the open arm in senescence-accelerated prone P10 mice. These studies suggest that diet supplementation with SAC may reduce age-related learning disabilities and cognitive disorders in senescence-accelerated mice.

PMID: 11238823 [PubMed - indexed for MEDLINE]

J Nutr. 2001 Mar;131(3s):1085S-92S.

In this study, the effect of SAC on the memory deficit and age-related changes of senescence-accelerated mice was examined. SAC was found to significantly attenuate the decrease in the conditioned avoidance response compared with mice not given SAC. In the elevated plus-maze test, SAC increased the time spent on the open arm in senescence-accelerated mice. Chronic dietary treatment with SAC decreased the time in the open arm in senescence-accelerated mice, suggesting that SAC may reduce age-related learning disabilities and cognitive disorders in senescence-accelerated mice.

In vitro effects of aged garlic extract and other nutritional supplements on sickle erythrocytes.

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In the circulation of sickle cell anemia patients, a certain population of erythrocytes has an elevated density. These abnormally dense cells are believed to be at the root of the painful crisis and anemia of the patients. We have developed an in vitro method for the preparation of these heavier erythrocytes by a repeated deoxy-oxy cycling of erythrocytes from sickle cell anemia patients. By using this method, we studied whether certain nutritional supplements would inhibit the formation of dense cells in vitro. It was found that aged garlic extract (AGE) as well as its components with antioxidant activity, i.e., S-alpha-lipoic acid and N alpha-(1-deoxy-D-fructos-1-yl)-L-arginine (fructosyl arginine), inhibited the formation of dense cells in vitro. Vitamin C, vitamin E and the spin-trapping agents, 5-diethoxyphosphoryl-5-methyl-1-pyrroline-N-oxide and alpha-(4-pyridyl-1-oxide)-N-t-butylnitrone were all found to inhibit the formation of dense cells in vitro. These results suggest that, when extremely stretched sickle-shaped cells are formed by the repeated deoxy-oxy cycling, the erythrocyte membrane becomes susceptible to oxidative injury by reactive oxygen species. The protection of the erythrocyte membrane from such an oxidative injury would prevent the membranes from becoming leaky to the calcium ion, thus inhibiting the activation of the calcium-activated potassium efflux channel and the formation of dense cells. We also developed a new ex vivo method of studying the possible efficacy of antioxidants taken orally on the dense cell formation in sickle cell patients. It involved the use of blood plasma taken from a healthy donor (with normal hemoglobin) of AB blood type who had consumed different types of antioxidants orally. By suspending sickle erythrocytes in such plasma and exposing them to the deoxy-oxy cycling, the degree of dense cell formation was determined. The degree of inhibition in vitro by antioxidants taken orally may be related to their efficacy in inhibiting dense cell formation in the patients. On the basis of these in vivo and ex vivo studies, we propose that a cocktail of antioxidants would have beneficial effects in lessening the incidence and severity of crisis and reducing anemia in sickle cell disease.

PMID: 11238822 [PubMed - indexed for MEDLINE]
Pharmacologic activities of aged garlic extract in comparison with other garlic preparations.

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We investigated the pharmacologic activities of four garlic preparations, raw garlic juice (RGJ), heated garlic juice (HGJ), dehydrated garlic powder (DGP) and aged garlic extract (AGE). The study used three animal models, i.e., testicular hypogonadism (hypospermatogensis and impotence) induced by warm water treatment, intoxication of acetaldehyde and growth of inoculated tumor cells. RGJ was found to be effective only in recovery of testicular function. The efficacy of HGJ was observed in three models; however, it did not improve impotence. DGP was effective in recovery of spermatogenesis and stimulated acetaldehyde detoxification. Significant beneficial effects of AGE were found in all three models. Although all four garlic preparations significantly enhanced natural killer (NK) and killer cell activities of the spleen cells of tumor-bearing mice, only AGE and HGJ inhibited the growth of inoculated tumor cells. These results suggest that different types of garlic preparations have different pharmacologic properties, and among the four garlic preparations studied, AGE could be the most useful garlic preparation.

PMID: 11238821 [PubMed - indexed for MEDLINE]

Enhanced immunocompetence by garlic: role in bladder cancer and other malignancies.

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Of the many beneficial actions of garlic, inhibition of the growth of cancer is perhaps the most remarkable. Our previous animal studies demonstrated that aged garlic extract was highly effective, and unlike the approved immunotherapy for human bladder cancer, bacillus Calmette--Guerin (BCG), garlic was effective when added to the diet. To elucidate the mechanism of this antitumor effect, the literature describing antitumor and immune-enhancing effects of garlic is reviewed. Garlic can detoxify carcinogens by stimulation of cytochrome P(450) enzymes, antioxidant activity or sulfur compound binding. Studies demonstrate a direct toxic effect of garlic to sarcoma and gastric, colon, bladder and prostate cancer cells in tissue culture, but these effects cannot explain the inhibition of growth of transplanted cancer in animal models. The most likely explanation of this effect is immune stimulation. Comparison of the effects of garlic to BCG immunotherapy reveals many similarities. Both stimulate proliferation of lymphocytes and macrophage phagocytosis, induce the infiltration of macrophages and lymphocytes in transplanted tumors, induce splenic hypertrophy, stimulate release of interleukin-2, tumor necrosis factor-alpha and interferon-gamma, enhance natural killer cell, killer cell and lymphokine-activated killer cell activity. These activities represent effective stimulation of the immune response. Studies suggest that garlic may be useful in preventing the suppression of immune response that is associated with increased risk of malignancy. Data suggest that maintenance of immune stimulation can significantly reduce the risk of cancer. Clinical trials should be initiated to test the hypothesis that the immune stimulation and other beneficial effects of garlic are able to reduce the incidence of cancer.

Publication Types:
Garlic and cancer: a critical review of the epidemiologic literature.

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Animal and in vitro studies provide evidence of an anticarcinogenic effect of active ingredients in garlic. This review of the epidemiologic literature on garlic consumption addresses cancers of the stomach, colon, head and neck, lung, breast and prostate. Nineteen studies reported relative risk estimates for garlic consumption and cancer incidence. Site-specific case-control studies of stomach and colorectal cancer, in which multiple reports were available, suggest a protective effect of high intake of raw and/or cooked garlic. Cohort studies confirm this inverse association for colorectal cancer. Few cohort and case-control studies for other sites of cancer exist. Garlic supplements, as analyzed in four cohort studies and one case-control report, from two distinct populations, do not appear to be related to risk. Low study power, lack of variability in garlic consumption categorization within studies and poor adjustment for potential cofounders may limit the reliability of any conclusions regarding garlic supplements. However, an indication of publication bias was also found by visual inspection of a funnel plot and in a log-rank test (P = 0.004). Evidence from available studies nevertheless suggests a preventive effect of garlic consumption in stomach and colorectal cancers. The study limitations indicate the need for more definitive research and improved nutritional epidemiologic analyses of dietary data.

Publication Types:
• Review
• Review, Tutorial

A historical perspective on garlic and cancer.

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Epidemiological and laboratory studies provide insight into the anticarcinogenic potential of garlic and its constituent compounds. Both water- and lipid-soluble allyl sulfur compounds are effective in blocking a myriad of chemically induced tumors. Part of the protection from these compounds probably relates to a block in nitrosamine formation and metabolism. However, blockage in the initiation and promotion phases of the carcinogenicity of various compounds, including polycyclic hydrocarbons, provide evidence that garlic and its constituents can alter several phase I and II enzymes. Their ability to block experimentally induced tumors in a variety of sites including skin, mammary and colon, suggests a general mechanism of action. Changes in DNA repair and in immunocompetence may also account for some of this protection. Some, but not all, allyl sulfur compounds can also effectively retard tumor proliferation and induce apoptosis. Changes in cellular thiol and phosphorylation stains may account for some of these antitumorigenic properties. The anticarcinogenic...
potential of garlic can be influenced by several dietary components including specific fatty acids, selenium, and vitamin A. Since garlic and its constituents can suppress carcinogen formation, carcinogen bioactivation, and tumor proliferation it is imperative that biomarkers be established to identify which individuals might benefit most and what intakes can occur with ill consequences.

Publication Types:
• Review
• Review, Tutorial

PMID: 11238810 [PubMed - indexed for MEDLINE]

J Nutr. 2001 Mar;131(3s):1006S-9S.
Molecular basis by which garlic suppresses atherosclerosis.

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The aim of this study was to determine the mechanism by which the aged garlic extract "Kyolic" has a protective effect against atherosclerosis. Plasma cholesterol of rabbits fed a 1% cholesterol-enriched diet for 6 wk was not reduced by supplementation with 800 microL Kyolic/(kg body. d). In spite of this, Kyolic reduced by 64% (P < 0.05) the surface area of the thoracic aorta covered by fatty streaks and significantly reduced aortic arch cholesterol. Kyolic also significantly inhibited by approximately 50% the development of thickened, lipid-filled lesions in preformed neointimas produced by Fogarty 2F balloon catheter injury of the right carotid artery in cholesterol-fed rabbits. In vitro studies found that Kyolic completely prevented vascular smooth muscle phenotypic change from the contractile, high volume fraction of filament (V(v)myo) state, and inhibited proliferation of smooth muscle cells in the synthetic state with a 50% effective dose (ED(50)) of 0.2%. Kyolic also slightly inhibited the accumulation of lipid in cultured macrophages but not smooth muscle, and had no effect on the expression of adhesion molecules on the surface of the endothelium or the adherence of leukocytes. It is concluded that Kyolic exerts antiatherogenic effects through inhibition of smooth muscle phenotypic change and proliferation, and by another (unclarified) effect on lipid accumulation in the artery wall.

PMID: 11238806 [PubMed - indexed for MEDLINE]

J Nutr. 2001 Mar;131(3s):989S-93S.

Cholesterol-lowering effect of garlic extracts and organosulfur compounds: human and animal studies.

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The medicinal use of garlic dates back thousands of years, but there was little scientific support of its therapeutic and pharmacologic properties until recently. In the past decade, the cancer-protective effects of garlic have been well established by epidemiologic studies and animal experiments. However, the cardiovascular-protective properties of garlic are less well understood. In particular, despite the reported hypocholesterolemic effect of garlic, the mechanism of the effect is unclear. In a recent randomized, double-blind, placebo-controlled intervention study, we showed that aged garlic extract (AGE) supplementation was effective in lowering plasma concentration of total cholesterol by 7% and LDL cholesterol by 10% in hypercholesterolemic men
compared with subjects consuming a placebo. Supplementation of AGE in animal diets similarly reduced plasma concentrations of total cholesterol and triacylglycerol by 15 and 30%, respectively. In subsequent experiments using cultured rat hepatocytes, we found 44--87% inhibition of cholesterol synthesis by the water-extractable fraction (WEF), methanol-extractable fraction (MEF) and petroleum ether-extractable fraction (PEF) of fresh garlic, and Kyolic (liquid form of AGE). These observations suggested that hydrophilic and hydrophobic compounds of garlic are inhibitory to cholesterol synthesis. Because S-allylcysteine (SAC) alone was less potent than Kyolic, which contains SAC and other sulfur compounds, a maximal inhibition appears to require a concerted action of multiple compounds of garlic. In a series of experiments, we further characterized the inhibitory potency of individual water-soluble and lipid-soluble compounds of garlic. Among water-soluble compounds, SAC, S-ethylcysteine (SEC), and S-propylcysteine (SPC) inhibited cholesterol synthesis by 40--60% compared with 20--35% by gamma-glutamyl-S-allylcysteine (GSAC), gamma-glutamyl-S-methylcysteine (GSMC) and gamma-glutamyl-S-propylcysteine (GSPC). Lipid-soluble sulfur compounds (i.e., diallyl sulfide, diallyl disulfide, diallyl trisulfide, dipropyl sulfide and dipropyl trisulfide) at low concentrations (0.05--0.5 mol/L) slightly (10--15%) inhibited cholesterol synthesis but became highly cytotoxic at high concentrations (1.0--4.0 mol/L). All water-soluble compounds, except S-allylmercaptocysteine, were not cytotoxic, judging from the release of cellular lactate dehydrogenase into the culture medium. Taken together, the results of our studies indicate that the cholesterol-lowering effects of garlic extract, such as AGE, stem in part from inhibition of hepatic cholesterol synthesis by water-soluble sulfur compounds, especially SAC.

Publication Types:
• Review
• Review, Tutorial

PMID: 11238803 [PubMed - indexed for MEDLINE]

J Nutr. 2001 Mar;131(3s):985S-8S.
Suppression of LDL oxidation by garlic.

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It has been known for several decades that hypercholesterolemia is a major risk factor for atherosclerosis and that lowering of cholesterol can significantly reduce risk for cardiovascular diseases. More recently, oxidation of LDL has been recognized as playing an important role in the initiation and progression of atherosclerosis. Oxidized LDL, but not native LDL, promotes vascular dysfunction by exerting direct cytotoxicity toward endothelial cells, by increasing chemotactic properties for monocytes, by transforming macrophages to foam cells via scavenger-receptors and by enhancing the proliferation of various cell types, e.g., endothelial cells, monocytes and smooth muscle cells; all of these events are recognized as contributing to atherogenesis. In this paper, experimental evidence is presented that shows that several garlic compounds can effectively suppress LDL oxidation in vitro. Short-term supplementation of garlic in human subjects has demonstrated an increased resistance of LDL to oxidation. These data suggest that suppressed LDL oxidation may be one of the powerful mechanisms accounting for the antiatherosclerotic properties of garlic.

Publication Types:
• Review
• Review, Tutorial

PMID: 11238802 [PubMed - indexed for MEDLINE]
Aged garlic extract, a modulator of cardiovascular risk factors: a dose-finding study on the effects of AGE on platelet functions.

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Aged garlic extract (AGE) has been shown previously to have moderate cholesterol-lowering and blood pressure-reducing effects. We have now investigated whether platelet function, a potential risk factor for cardiovascular disease, can be inhibited by AGE administration. In a randomized, double-blind study of normal healthy individuals (n = 34), both men and women, the effect of AGE was evaluated in doses between 2.4 and 7.2 g/d vs. equal amounts of placebo. Platelet aggregation and adhesion were measured at 2-wk intervals throughout the study. Threshold concentrations for epinephrine and collagen increased moderately during AGE administration compared with the placebo and baseline periods. Only at the highest supplementation level did AGE show a slight increase in the threshold level of ADP-induced aggregation. Platelet adhesion to collagen, fibrinogen and von Willebrand factor was investigated by perfusing whole blood through a laminar flow chamber under controlled flow conditions. Adherence of platelets was inhibited by AGE in a dose-dependent manner when collagen was the adhesive surface perfused at low shear rates (approximately 30 s\(^{-1}\)). At high shear rates (1200 s\(^{-1}\)), AGE also inhibited platelet adhesion to collagen but only at higher intake levels. Adhesion to von Willebrand factor was reduced only at 7.2 g/d AGE, but adherence to fibrinogen was potently inhibited at all levels of supplementation. Thus, AGE exerts selective inhibition on platelet aggregation and adhesion, platelet functions that may be important for the development of cardiovascular events such as myocardial infarction and ischemic stroke. We briefly review the effect of garlic preparations in general on cardiovascular risk factors and point out differences between AGE and other garlic preparations that we feel are important to explain the efficacy of AGE.