

DIVERSITEA®

Antioxidant and MO Properties

Diversitea Antioxidant Properties

This document is a compilation of information concerning the different ingredients of Original Blend Diversitea Herbal Supplement Tea for Divers, and how they work to assist the body in dealing with the physiological stresses of Scuba Diving

For the past 5 years, I have focused on Red Clover as the primary ingredient that causes Diversitea to work. This is because of the relatively high concentration of Molybdenum – the trace element the body uses to discharge Nitrogenous waste. I have been peripherally aware that Red Clover is Antioxidant, and that many of the components of Diversitea had high levels of Vitamin C (also Antioxidant) and naturally occurring Electrolytes as a result.

Recently I began researching the Antioxidant properties of all the ingredients, and discovered that in *every* case, the primary characteristic of the herb was found in its Antioxidant properties. Hibiscus, which was chosen for its ability to stabilize Blood Pressure, does so through the use of flavonoids, polyphenolics and anthocyanins found in its makeup. The same phenomenon occurred with Galangal, Cran-Max®, Rose Hips and Orange Peel. Stevia has antioxidant properties, but they are not primary. Stevia's role is as a Pancreas support herb. Cran-Max assists UT efficiency as well.

I am now beginning to hypothesize that Diversitea works in a dual way, and that drinking Diversitea conditions the body by supplying it with natural, unprocessed antioxidants as well as the trace mineral, MO. The hydration factor is also critical, but Diversitea offers more to the diver than water alone.

History and background information

Diversitea owner Janine Davis began blending teas in the 1980's to treat various health conditions that were not responsive to allopathic (conventional) treatments. She studied plant remedies extensively, and amassed a substantial knowledge base.

In 1996 she became a certified diver, and ran across this passage in a reference book :

“Nutritional Scientists have discovered that Red Clover blossoms contain the trace element Molybdenum, that is now beginning to be recognized as a very essential nutrient in relatively minute quantities. Molybdenum plays an important role involving the discharge of Nitrogen from our bodies. Molybdenum's essential trace accumulations are in the liver, kidneys, bone and skin. The Molybdenum in Red Clover Tops helps the system to discharge Nitrogenous waste, aids in cleaning the system of impurities, and helps retard the spread of infection.”¹

This led her on a quest to discover whether this property would hold true for Scuba divers. Over the next several years, she went on dive trips, carrying her water bottle of Red Clover Tea and enduring the skeptical looks of fellow divers when she explained that this tea helped her feel less tired than when she did not use it. She thought if it even added a small edge to her margin of safety in terms of nitrogen elimination, it was worth using.

As her research continued, she started experimenting with other herbs whose properties would enhance the diving experience, as well as add flavor and nutritional benefits to the blend.

At the beginning of 2002, convinced that there was real potential for this product to make a difference in diver safety, Davis started working with a manufacturing facility to develop Diversitea.

In March 2002, Diversitea received its first “sea trial” on a live-aboard Safari in the Maldives with 12 divers, most of whom were willing to try the tea, and fill out a questionnaire at the end of the trip. The result of this test was that all reported feeling less fatigued after multiple dives on multiple days, and found the tea refreshing. All now use Diversitea regularly.

¹ Jack Ritchason, N.D. *The Little Herb Encyclopedia*. Woodland Health Books, Pleasant Grove, UT 402 pp

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In 2002 Davis was Nitrox certified, and realized the effect of drinking Diversitea is similar to that of diving using Recreational (32 to 36 percent) Nitrox. During dive trips one feels less fatigued after repetitive dives over several days. However, with Diversitea there is no issue of Oxygen Toxicity to contend with. Rodale's Scuba Diving Magazine dubbed Diversitea "Nitrox in a Cup²".

Original Blend Diversitea is made with Red Clover Flowers, Hibiscus flowers, Orange Peel, Rose Hips, Cran-Max® Cranberry Extract, Galangal (a type of Ginger), and Stevia. The Red Clover is the component containing Molybdenum, which is what assists the body in Nitrogen reduction in tissues. It is also an Anti-Oxidant. Hibiscus is commonly used to lower blood pressure, and is brewed and consumed all over the world. In Mexico and the Caribbean it is known as "Jamaica" and it is practically Egypt's national beverage. Galangal is commonly used for seasickness, and also to warm the system. Cranberry assists the function of the Kidneys and Urinary Tract, and helps support the elimination of toxins from the system. Stevia is a Pancreatic and anti-mucous herb, which is actually good for Diabetics. It is the sweetening agent in Diversitea.

Herbal Tea seems to be the optimum way to consume the trace mineral Molybdenum, as the Gastrointestinal Tract readily absorbs soluble (but not insoluble) MO. Herbal teas are also synergistic, in that the various constituents of different herbs are more effective in combination with others, than taken individually.

In addition, it has been proved that hydration is a critical factor in the prevention of "undeserved" DCS hits. Diversitea has a pleasant flavor, is extremely healthy, and contains no Caffeine, Aspartame, or sugar. Divers tend to stay better hydrated by drinking Diversitea, rather than carbonated, caffeinated and chemical-loaded beverages.

In February 2003, Diversitea was introduced at the First Russian Diving Exhibition in Moscow, Russia. Diversitea became very popular and came to the attention of the Russian Navy. In 2004, testing commenced at the Makarov State Maritime Academy in St. Petersburg. Copies of the test results can be found in this report, which is summarized as follows:

****A controlled study was conducted where two groups of mice (50 in each group) were taken to 180 meters (about 600 feet) in a hyperbaric chamber for 20 minutes, then brought up to surface pressure, with a 3 minute safety stop at 3 meters/15 feet.**

One group was given Diversitea for three weeks before being submerged and the control group received plain water. Upon ascent, the mice who received Diversitea had a mortality rate of 14%, and the control group mortality rate was 70%. In other words, 86% of the mice who were given Diversitea survived, and only 30% of the control mice survived.

This led the testers to conclude that Diversitea Herbal Supplement Tea appears to have a positive effect on the reduction of Nitrogen.

There have been undocumented reports that Diversitea has an immediate effect upon the onset of DCS 1 symptoms, such as crawling skin, nerve tingling, etc. Divers most frequently report a noticeable increase in energy during days of multiple repetitive diving.

Diversitea has been available since May 2002, and has been marketed almost exclusively to the Diving community. Many divers have reported that they feel more energized, and less fatigued when drinking Diversitea during dive trips, and Diversitea is well accepted in the community as doing what it claims to do.

² Rodale's Scuba Diving March, 2003 20 pp

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MO (Molybdenum) Function in Humans

Molybdenum is a very important mineral for regulating the pH balance in the body. For each one tenth of a pH point difference, the oxygen level in the blood may increase or decrease by ten times. This has a direct change on the metabolism and the body's ability to burn fat. If the body doesn't have enough oxygen, the metabolism cannot oxidize enough to burn fat.

Molybdenum is a vital part of three important enzyme systems and is necessary for the proper function of certain enzyme-dependent processes, including the metabolism of iron. When the iron stored in the liver is freed by the molybdenum-dependent enzymes, it then can carry oxygen to body cells and tissue.

Molybdenum works with the enzyme systems to help eliminate toxic nitrogen waste by turning it into uric acid. The uric acid then can be converted and more easily flushed out of the system.

Recommended Dietary Allowances: adults, 75 mcg to 250 mcg The obscure element molybdenum is a component of the enzyme "xanthine oxidase" and an essential trace mineral. It helps generate energy, process waste for excretion, mobilize stored iron for the body's use, and detoxify sulfites (chemicals used as food preservatives)

Molybdenum is also necessary for iron utilization, alcohol detoxification, and a component involved in the production of uric acid (a nitrogen waste product of protein metabolism). It may also act as an antioxidant and be important in normal sexual function in men. Molybdenum works with vitamin B2 in the conversion of food to energy. Molybdenum has been used to detoxify copper in cases such as Wilson's disease where levels are too high. Molybdenum competes with copper at absorption sites and amounts of 500 mcg per day have been found to cause significant losses of copper. The average adult body contains about 9 mg with the highest concentrations in the liver, kidneys, bone, and skin.

The estimated safe and adequate intake is 75 to 250 mcg per day. Average daily intake in the USA ranges from 50 to 500 mcg per day. Molybdenum can be found in: peas, legumes, whole grains, pastas, dark-green leafy vegetables, yeast, milk, and organ meats.

Mo absorption by humans The gastrointestinal tract readily absorbs soluble, but not insoluble, molybdenum compounds [Wester et al., 1971]. Absorption rate of molybdenum from the diet of both patients and healthy volunteers averaged about 50% in one study and 88-93% in another study in which the patients received 22-1490 mcg Mo/d for 24 days.

MOLYBDENUM (Mo)

General - trace mineral; detox mineral;

Adult body contains about 9 mg;

History: essentiality for humans established in 1953;

Nutrition

Sources: best: lentils, liver, peas*, cauliflower, brewer's yeast, wheat germ, spinach; good: kidney, garlic, whole grains, eggs, fish, sunflower seeds; poor: refined foods, foods grown on molybdenum-deficient soils; supplements: molybdenum salts, amino acid chelates, multi-mineral, multi-mineral-vitamin formulations; Absorbed readily from stomach & upper small intestine; 25 to 80% of ingested molybdenum is absorbed; Storage: mainly in liver & kidneys; adrenal glands, bones, & skin;

Excretion: through kidneys; rapidly turned over;

Metabolism: works with fluoride; high copper intake increases molybdenum excretion; high sulphates increase molybdenum excretion;

Interactions: high molybdenum results in high urinary losses of copper; tungsten is antagonist to molybdenum metabolism;

Functions of Molybdenum As co-factor of an enzyme (xanthine oxidase), molybdenum is involved in mobilizing iron from liver storage to oxidize aldehydes;

Helps to remove nitrogen waste from the body through the formation of uric acid (purine metabolism); uric acid is a powerful anti-oxidant; molybdenum appears to play role in control of aging;

Detoxifies one class of food preservatives (sulphating agents) by means of molybdenum-containing enzyme (sulphite oxidase); sulphites can cause nausea, diarrhoea, acute asthma, coma, & death in sensitive individuals; bisulphite destroys vitamin B-1;

Involved in fat metabolism & energy production through molybdenum-activated enzyme (aldehyde oxidase);

Catalyzes reactions which transfer an oxygen atom from water to various compounds; simultaneous exchange reactions: give up 2 electrons at one end of molecule + cause 2 protons to be given up at other end of molecule; Powerful agent for reducing copper levels;

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Bubble Formation

Aviat Space Environ Med. 2006 Oct ;77 (10):1068-76 17042253 [Gas nuclei, their origin, and their role in bubble formation.](#) [My paper] [Jean-Eric Blatteau](#) , [Jean-Baptiste Souraud](#) , [Emmanuel Gempp](#) , [Alain Boussuges](#) Gas bubbles are the primary agent in producing the pathogenic effects of decompression sickness. Bubble formation during decompression is not simply the consequence of inert gas supersaturation. Numerous experiments indicate that bubbles originate as pre-existing gas nuclei. Radii are on the order of 1 microm or less. Heterogeneous nucleation processes are involved in generating these gas entities. Musculoskeletal activity could be the main promoter of gas nuclei from stress-assisted nucleation. The half-life and faculty for nuclei to initiate bubble formation during decompression depend on many factors. Oxygen window and surface tension are involved in resolving bubbles. Two factors have been proposed to stabilize gas nuclei against dissolution: gas nuclei trapped in hydrophobic crevices and gas nuclei coated with surface-active molecules such as surfactants. Diffusion and surface tension could play an important role in the formation of gas nuclei crevices. However, while the concept of in vivo hydrophobic crevices remains a theoretical possibility, none have yet been identified in tissues and/or in microcapillaries. Moreover, while surfactants seem present in numerous tissues and could play a role in gas nuclei stabilization, they could also be involved in bubble elimination. The understanding of such mechanisms is of primary importance to neutralize nuclei and for modeling bubble growth. Here we present in a single document a summary of the original findings and views from authors in this field.

Benefit of Antioxidants for Scuba Divers

Supplementation of antioxidants prevents oxidative stress during a deep saturation dive.[Ikeda M](#), [Nakabayashi K](#), [Shinkai M](#), [Hara Y](#), [Kizaki T](#), [Oh-ishi S](#), [Ohno H](#).
Japan Maritime Self-Defense Force Undersea Medical Center, Yokosuka.

Conflicting views exist at the present regarding the influences of a deep saturation dive on liver function in divers. Therefore, we first reevaluated whether a deep saturation dive (400 msw) induces a hepatic disturbance. As the result, plasma activities of both transaminases (aspartate aminotransferase [AST] and alanine aminotransferase [ALT]) increased significantly, whereas cholinesterase (Ch-E) activity decreased markedly, being highly suggestive of liver dysfunction. Assuming that the liver dysfunction was attributable to oxidative stress, we next examined the effects of supplementation of antioxidants (600 mg of vitamin C, 150 mg of alpha-tocopherol, and 600 mg of tea catechins per day) on liver function in saturation divers. As was anticipated, the antioxidants taken appeared to prevent a hepatic disturbance, indicating that a deep saturation dive provokes liver dysfunction probably due to oxidative stress. Thus, we recommend that saturation divers should take supplements of antioxidants. PMID: 15297742
http://www.ncbi.nlm.nih.gov/sites/entrez?cmd=Retrieve&db=PubMed&list_uids=15297742&dopt=AbstractPlus

Can Antioxidants Protect Scuba Divers?

Science Daily — A new study, published in The Journal of Physiology, shows that acute oral intake of largely accepted antioxidants Vitamin C and E prior to a scuba dive can reduce alterations in cardiovascular function, particularly acute endothelial dysfunction, that are caused by a single field air dive.

People scuba dive for recreational and professional purposes. However, only recently has evidence of the different cardiovascular changes that appear after each scuba dive been seen. In most cases those changes are silent or subclinical, posing little or no threat to the health of divers, but is that always the case?

Obad, Dujic and their colleagues at the University of Split School of Medicine, collaborating with the Norwegian University of Science and Technology, studied a group of professional scuba divers before and after a moderate load scuba dive (a dive to a depth of 30 meters for 30 minutes, similar to those enjoyed by countless recreational divers). Different cardiovascular parameters were investigated, including endothelial function. A single scuba air dive induced mild changes in cardiac function and a significant decrease in endothelial function. The authors thought that these changes could be influenced by oral ingestion of

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antioxidant vitamins C and E prior to diving, and that endothelial function, in particular, might be preserved.

This intervention showed a positive effect on vascular endothelial function, whereas other cardiac functional changes were unaffected. Although generally very safe, diving may be associated with serious, and sometimes fatal, consequences, which are usually related to decompression sickness. These new data raise the possibility that pre-dive intake of antioxidant vitamins may prevent some of the negative effects of diving on vascular function. The results of this study are of interest for those involved in all types of recreational and professional diving.

Note: This story has been adapted from a news release issued by Blackwell Publishing Ltd..

In the last few years, antioxidants have been touted and heralded for a number of potential health and longevity benefits (not all of which, to date, are entirely proven).

In fact, the endless stream of commercials, infomercials, books, pamphlets, and talk show sessions devoted to the near-celebrity status of antioxidants have made the majority of us believers in them. And if you ask the casual person on the street what antioxidants are for, you'll likely get one of the following answers: "They help you live longer"; "They prevent disease"; "They make you healthy".

And, as time will tell, they may or may not do all of those things. However, few of those respondents would know that two specific antioxidants may be helpful for, of all things, scuba diving. On this subject, the Journal of Physiology has reported an important study that may help stop diving problems, especially circulation and high blood pressure.

The study included seven expert divers and two antioxidant vitamins, vitamins C and E. The researchers in charge of the study were from the University of Split School of Medicine in Croatia and the Norwegian University of Science and Technology.

The team carried out the research by allowing the divers to perform two 30 minute 30-metre dives, 24 hours apart. This depth and time limit is similar to most recreational dives enjoyed by scuba divers, though the study is hoping to help those who dive recreationally and professionally for longer time periods.

They gave the divers quantities of both vitamin C and E, two hours before the second dive. Six of the seven divers came back in eight months for another trial, where some were given placebos and others were given the correct dosage of vitamins.

The researchers concluded that the antioxidants helped to improve vascular endothelial function, allowing the cells lining the blood vessels to work properly, instead of creating what is commonly known as endothelial dysfunction. Endothelial dysfunction is a physiological dysfunction of normal biochemical processes carried out by the cells that line the inner surface of all blood vessels, including arteries, veins and the innermost lining of the heart and lymphatics. endothelial dysfunction is believed to be caused by gas bubbles invading the circulatory system during and after decompression.

High blood pressure is also very common for divers and is responsible for other conditions, such as fluid on the lungs. Although the study results showed that taking the [antioxidants](#), vitamins C and E, before a dive could be helpful in eliminating illnesses caused by decompression, diving experts aren't convinced.

They agree that antioxidants remove excess by-products and aren't harmful, yet have stated they believe the overall effect is extremely limited. Longer studies with more subjects will have to be conducted before the positive results can be seen as conclusive. Author **Tim Moore**
<http://ezinearticles.com/?Antioxidants-for-the-Sport-of-Scuba-Diving&id=505532>

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Hibiscus Antioxidant Properties

It is thought that the antioxidant chemicals, such as flavonoids, polyphenolics and anthocyanins, contained in the flower play a large role in preventing the oxidation of low density lipoproteins (the “bad cholesterol”). This oxidation is what contributes to atherosclerosis, the build up of a waxy plaque on the walls of arteries. <http://www.kingtutshop.com/Egyptian-Herb/hibiscus.htm>

Antioxidant Actions of Dried Flower Extracts of *Hibiscus sabdariffa* L. On Sodium Arsenite - Induced Oxidative Stress in Rats Full Study)

<http://www.pjbs.org/pjnonline/fin286.pdf>

According to a study performed by Shan Medical University's Institute of Biochemistry in Taiwan, extract from the hibiscus flower (*Hibiscus sabdariffa*) lowers both low-density lipoprotein cholesterol levels and the risk of heart disease. These results were published in the September 15th issue of the Journal of the Science of Food and Agriculture. Dr. Chau-Jong Wang and his colleagues suspect that the high antioxidant content contained in the hibiscus extract contributes to the lowered LDL levels noted in the experiment.

For the experiment, Wang and colleagues divided rats up into three groups, according to the atherosclerosis-inducing diet they were to be placed on. One group was placed on a high cholesterol diet, while the second group was placed on a high fructose diet. High glucose levels are thought to increase triglyceride levels, contributing to the fact of why diabetics are more susceptible to higher cholesterol levels and heart disease. Some groups containing each diet were supplemented with hibiscus extract to see whether or not it had any affect on their cholesterol levels. According to the results, both groups saw a surprising decrease in low density lipoproteins upon the administration of hibiscus flower extract. Additionally, the rats consuming a high fructose diet also saw a decrease in triglyceride levels. It is thought that the antioxidant chemicals, such as flavonoids, polyphenolics and anthocyanins, contained in the flower play a large role in preventing the oxidation of low density lipoproteins (the “bad cholesterol”). This oxidation is what contributes to atherosclerosis, the build up of a waxy plaque on the walls of arteries.

Does the news that hibiscus flower extract actually has some therapeutic value surprise scientists? Not really. Hibiscus flower extract has been used in many folk remedies for liver disorders and high blood pressure. However, this is the first piece of research that establishes the healthy benefits of consuming hibiscus flower extract. <http://cholesterol.about.com/od/herbalmedicine/a/hibiscus.htm>
The Effect of Hibiscus sabdariffa L. Tisane on Blood Pressure in Prehypertensive and Mildly Hypertensive Men and Women (Using tea) Authors McKay, Diane - TUFTS HNRCA [Blumberg, Jeffrey](#)

http://www.ars.usda.gov/research/publications/Publications.htm?seq_no_115=211531

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Orange Peel Antioxidant Properties

Orange Peel Bioflavonoids: Orange Peel is a rich, natural source of citrus bioflavonoids, essential for the processing of vitamin C and maintaining the capillary walls, as well as supporting the digestive system. Bioflavonoids are beneficial in a wide range of health-related uses because of their antioxidant abilities. They are also known for counteracting the oxidation-promoting effects of stress hormones secreted in high amounts during chronic stress.

Fractionation of orange peel phenols and evaluation of their antioxidant levels

Submitted to: American Chemical Society National Meeting

Publication Type: Abstract

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Citation: Manthey, J.A. Fractionation of orange peel phenols and evaluation of their antioxidant levels. 222nd National Meeting of American Chemical Society. 2001. Paper No. AGFD0091.

Technical Abstract: Orange peel contains numerous flavonoids, hydroxycinnamates, and related phenolic compounds. Among the flavonoids are several main structural categories, including the flavanone di- and triglycosides, flavone-O- and C-glycosides, and the highly methoxylated flavone aglycones, termed polymethoxylated flavones. The hydroxycinnamates are rich in ferulic and p-coumaric acid esters, along with a small number of sinapic acid conjugates. Numerous miscellaneous phenolic compounds also occur, and tend to be more polar than the flavonoids components. Chromatographic methods were used to isolate these diverse categories of compounds from the concentrated orange peel molasses generated during orange processing. Total amounts of each category (mg per Kg 10 °Brix ultrafiltered molasses) were reported. Total phenolic levels and total reducing potential of each category were determined, as well as the total antioxidant levels. Comparisons were also made between these categories in orange and lemon peel molasses. The results show that several of the main categories of citrus peel phenolics are excellent sources of dietary antioxidants.

http://www.ars.usda.gov/research/publications/publications.htm?SEQ_NO_115=137745



Pilot extraction of carotenoids from orange peel of the Valencia variety.

http://grande.nal.usda.gov/ibids/index.php?mode2=detail&origin=ibids_references&therow=795391

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Red Clover Antioxidant Properties

Red clover extract as antioxidant active and functional food ingredient*[1](#)

G. Th. Kroyer   Institute of Chemical Engineering, Division of Natural Products and Food Chemistry, University of Technology, Vienna, Austria Received 6 April 2003; accepted 19 May 2003

Abstract Red clover is a rich source of isoflavones which are reported to have beneficial estrogenic effects and, moreover, contains significant amounts of polyphenolic substances which are known for their potential bio-active antioxidant properties and radical scavenging capacity. The concentration of total polyphenols was remarkably high in the red clover extract (153 mg/g) and in a red clover based food supplement (114 mg/g), above all in comparison to soy extract (18 mg/g). In correlation with the respective total content of polyphenols, the DPPH radical scavenging capacity was found to be most pronounced in the red clover extract (EC₅₀: 0.32 mg/ml; ARP: 7) and the red clover preparation (EC₅₀: 0.50 mg/ml; ARP: 5) whereas the soy preparation showed only minor radical scavenging capacity (EC₅₀: 1.09 mg/ml; ARP: 2). In consideration of the beneficial nutritional-physiological and health promoting effects of isoflavones and polyphenols red clover extract could be regarded as a potent antioxidant and radical scavenging active and functional food ingredient or dietary food supplement.

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6W6D-496NGVD-3&_user=10&_coverDate=03%2F31%2F2004&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=88789fba8caa96f39c82a945fc6837ff

Red Clover Antioxidant activity and improving immunity

Free radicals are very unstable molecules, which can react quickly with other compounds. Some free radicals arise during metabolism, and some are caused by environment pollution, UV-ray and cigarette smoking, etc. Free radicals can snatch electrons of normal cells continually, thereby damage living cells and accelerate cell decrepitude. An experiment conducted by Wei et al showed genistein and daidzein significantly inhibit TPA-induced free radical formation. Furthermore, genistein is potent in inhibiting free radical generation. William banz reported that daidzein shows higher antioxidant level than SOD in liver cell of rat. Animal model experiments showed dietary administration of genistein for 30 days significantly enhances the activities of antioxidant enzymes in the skin and small intestine. Red clover extract is also potent in erasing wrinkles, keeping skin cells younger.

Zhang RQ reported that rat administered formononetin or daidzein for 7 days significantly improves rat thymus gland weight and macrophage function. And studies on pigs showed formononetin can also improve immunity. Schrepfer S reported that Biochanin A inhibits MHC class II antigen upregulation, which shows an immunomodulating effect.

<http://video.surfnet.nl/assemblage/messages.eb?sessionid=565BB64742B3EABD9083C4F85DC3453A?thread=192>

Antioxidants and Phenols Defined

According to Shioh Y. Wang, a scientist at the USDA's Beltsville Agricultural Research Center in Beltsville, Maryland, "antioxidant activity measures the ability of foods, blood plasma, and just about any substance to subdue oxygen free radicals." Over the years, antioxidants have become synonymous with good health. They are a class of compounds thought to prevent certain types of chemical damage caused by an excess of free radicals, charged molecules that are generated by a variety of sources including pesticides, smoking, and exhaust fumes. Some scientists believe that destroying free radicals may help fight cancer, heart disease, and stroke. "More succinctly," says Shioh, "antioxidant activity is a measure of the ability of a food sample to disarm oxidizing compounds, which our bodies naturally generate as a byproduct of metabolism."

Shioh says the term "phenol" or "phenol compound" embraces a wide range of substances that possess an aromatic carbon ring bearing an OH group, or hydroxyl substituent, including their functional derivatives. Among the natural phenolic compounds, of which several hundreds are known, the flavonoids and their relatives form the largest group, but phenolic quinones, lignans, xanthones, depsidones, and other groups,

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exist in considerable numbers as well as many simple monocyclic phenols. Hence, the total number of phenols in a given sample of food is referred to as its "phenolic content."

Red Clover Phenol Content

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6W6D-496NGVD-3&_user=10&_coverDate=03%2F31%2F2004&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=88789fba8caa96f39c82a945fc6837ff

Red clover is a rich source of isoflavones which contain significant amounts of polyphenolic substances which are known for their potential bio-active antioxidant properties and radical scavenging capacity. The concentration of total polyphenols was remarkably high in the red clover extract (153 mg/g) and in a red clover based food supplement (114 mg/g)

In consideration of the beneficial nutritional-physiological and health promoting effects of isoflavones and polyphenols red clover extract could be regarded as a potent antioxidant and radical scavenging active and functional food ingredient or dietary food supplement. In correlation with the respective total content of polyphenols, the DPPH radical scavenging capacity was found to be most pronounced in the red clover extract (EC₅₀: 0.32 mg/ml; ARP: 7) and the red clover preparation (EC₅₀: 0.50 mg/ml; ARP: 5)

Red Clover

Phytochemicals: Salicylates, [Flavonoids](#),

Medicinal properties: Red clover has many medical properties. It is mainly used for the treatment of skin disorders and menopausal symptoms. The flowering heads of red clover increases the production of urine and bile and improves the blood circulation. Red clover is used in the treatment of skin disorders, such as eczema and psoriasis, breast cancers, gout and coughs. Red clover ointments are used to treat skin problems such as psoriasis and eczema.

Red clover contains high levels of isoflavones, which are effective for the treatment of menopausal symptoms, such as hot flashes, cardiovascular problems and osteoporosis. The following isoflavones are present in red clover: biochanin A, formononetin, genistein and daidzein.

Other facts: Red clover is a wild plant, which originated from Asia but has spread throughout the world. Red clover is abundant throughout Europe, Central and Northern Asia and has also been introduced in North America. As the name *bee-bread* suggests, red clover produce a honey. The roots of red clover have special nodules that house nitrogen-fixing bacteria.

http://www.kroegerherb.com/hi_redclover_0405.html

Red clover is an amazingly versatile plant that is frequently classified as a tonic in Western herbalism because it rebalances and strengthens so many organ systems. Traditional herbalists have employed red clover for centuries as both a nutritive and cleansing remedy because of its blood and lymph detoxifying properties. This has led to traditional, folk-herbalism applications for anemia, fatigue, arthritis, fevers, chronic inflammatory respiratory complaints and tumors.

Red clover has also been the focus of scientific research over the last 40 years. Early research found the leaf is high in chlorophyll, one of the best detoxifying and blood-building molecules known. The chlorophyll molecule closely resembles hemoglobin, the pigment in red blood cells, except it contains magnesium where hemoglobin contains iron. Thus, it is an easy chemical slight of hand for the body to substitute iron for magnesium to build stronger blood. Fortunately, red clover tops contain iron, so the necessary ingredients are already provided in the whole plant. Chlorophyll also supplies natural deodorant and antioxidant properties.

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Minerals

Red clover tops are also high in many other minerals. these include chromium, which is valuable for balancing blood sugar, as well as magnesium, copper, phosphorus and calcium, suggesting applications for the support of healthy bones and joints. Additionally, it contains molybdenum, which is used in detoxification regimens by orthomolecular physicians and nutritionists for chronic illnesses involving excessive toxicity levels, as in allergies, arthritis, environmental illness, to chelate heavy metals and other environmental toxins.

Hoxley Tonic – Red Clover (*Trifolium Praetense*)

<http://content.herbalgram.org/seelectea/herbalgram/articleview.asp?a=2270>

"The Eclectics were able to differentiate well the activities of various plants," the erudite researcher notes. "But most importantly, they were effective clinical observers. They could tell what worked and what didn't. Even though their results were positive, their explanations were very often wrong, based on the limitations and understanding of medicine and science at that time. They had an empirical approach to medicine in which it's clinical results that one looks for, not the absolute guarantee of understanding the process involved. They were willing to use anything that worked. In fact, conventional medicine eventually incorporated that philosophy of Eclecticism using clinical results and observations, which today are established through controlled, double-blind studies."¹⁷

....."Several decades later," Brinker noted, "in advertisements appearing in medical journals, Parke, Davis, and Co. identified the Syrup Trifolium Compound as a long-established success prescribed in every civilized country in the world."¹⁸ Credited to an obscure Dr. Rush, about whom nothing more is known, the formula was also described in an official American Pharmaceutical Association listing of drugs called the National Formulary in 1926 and 1936.

Yet another Extract of Trifolium Compound was listed in the 1898 *King's American Dispensatory*, the preeminent compilation of medicines used by Eclectic doctors. Produced by the W. S. Merrell Co. of Cincinnati, it was celebrated for "the alterative, tonic, and eliminative properties of the recently expressed juices of extracts from fresh or green plants with potassium iodide." It was prescribed for syphilis, scrofula, rheumatism, and glandular and skin conditions. Trifolium compound was essential to the very fabric of the Eclectic and naturopathic view of disease. It was used for its tonic, alterative, and eliminative properties. He explains these important concepts.

"Tonics, often bitter, were employed to increase the appetite and enhance the processes of digestion and assimilation. They improved the quality of the blood and the nutrition of the entire system.

"Alteratives, known in folk medicine as 'blood cleansers,' were seen as assisting organs that remove metabolic waste and toxins from the circulation. Alteratives were believed to improve the quality of the blood by assisting digestion, improving circulation, and accelerating the processes of elimination, thereby correcting faulty metabolism. The knowledge concerning their action was wholly empirical. Health was seen as a product of the quality of the blood, since the blood brings nourishment to tissues and cells and must remove the cellular waste." In the Eclectic view, an alterative favorably alters the course of an illness. It is used for chronic conditions in small amounts over prolonged periods. Dr. Durkee explicitly characterized the tonic as an alterative.

The eliminative function is also essential. "Cleansing the blood," Brinker continues, "occurs as it is filtered through the organs which excrete cellular waste products. When these organs of elimination do not function adequately, it becomes increasingly difficult to maintain a healthy ecology of the cells.

"Attempting to enhance elimination and immune function can be done by utilizing a variety of methods and agents including herbs," Brinker observes. "This model for the action of alteratives was practically applied by the late-nineteenth-century Eclectic prescribers in the treatment of chronic and cancerous conditions.

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Such was their success that the alteratives were considered to have been among the most useful medicines in Eclectic therapeutics."

FLAVONOIDS

<http://www.phytochemicals.info/phytochemicals/flavonoids.php>

Flavonoids are found in most plant material. The most important dietary sources are fruits, tea and soybean.

Green and black tea contains about 25% percent flavonoids. Other important sources of flavonoids are apple (quercetin), citrus fruits (rutin and hesperidin),

Action of Flavonoids: Flavonoids have antioxidant activity. Flavonoids are becoming very popular because they have many health promoting effects. Some of the activities attributed to flavonoids include: anti-allergic, anti-cancer, antioxidant, anti-inflammatory and anti-viral. The flavonoids quercetin is known for its ability to relieve hay fever, eszema, sinusitis and asthma.

Epidemiological studies have illustrated that heart diseases are inversely related to flavonoid intake. Studies have shown that flavonoids prevent the oxidation of low-density lipoprotein thereby reducing the risk for the development of atherosclerosis.

The contribution of flavonoids to the total antioxidant activity of components in food can be very high because daily intake can vary between 50 to 500 mg.

Red wine contains high levels of flavonoids, mainly quercetin and rutin. The high intake of red wine (and flavonoids) by the French might explain why they suffer less from coronary heart disease than other Europeans, although their consumption of cholesterol rich foods is higher (French paradox). Many studies have confirmed that one or two glasses of red wine daily can protect against heart disease.

Tea flavonoids have many health benefits. Tea flavonoids reduce the oxidation of low-density lipoprotein, lowers the blood levels of cholesterol and triglycerides.

Soy flavonoids (isoflavones) can also reduce blood cholesterol and can help to prevent osteoporis. Soy flavonoids are also used to ease menopausal symptoms.

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Galangal (Asian Ginger) Antioxidant Properties

INTRODUCTION

Lesser galangal (*Alpinia officinarum*, Hance) is one of a number of herbal plant species that has been and continues to be extensively studied. The plant has many consistently identifiable active compounds. By and large, the studies focus on one or more such compounds.

The following bullet points summarize the effects attributable to compounds found in lesser galangal.

They are listed in the same sequence as documented by the articles abstracted below.

- Anti-Inflammatory
- Antioxidant
- Tumor Suppressive/Cancer preventive

Apoptosis

Enhancing anti cancer drug efficacy

Effect on Fatty Acid Synthase

Binds Adenosine receptors

Free radical scavenging

Chemoprotection prevents genotoxicity

COX-2 Inhibition

- Anti-atherogenic (preventive against atherosclerosis)

Diminishes lipid peroxidation and free radical formation

o Scavenges free radicals

o Lowers cholesterol and triglycerides

Inhibits the inflammatory component of plaque formation

- Antibiotic/antiviral/antiparasitic/antifungal

• Antiemetic

• May enhance cancer drug efficacy by reducing tumor resistance

• Long history in folk medicine world wide

Following are the active chemical compounds identified in lesser galangal to date:

Major Compounds: beta-Sitosterol (I), Galangin (II), Emodin (III) and Quercetin (IV)

Seven phenylpropanoids:

1,7-diphenyl-5-ol-3-heptone, 1-phenyl-7-(3'-methoxyl-4'-hydroxyl) phenyl-5-ol-3-heptone, glandin, kaempferol-4'-methylether and 3,4-dihydroxybenzoic acid

Five diarylheptanoids: 1,7-diphenylhept-4-en-3-one, dihydroyashabushiketol (1,7-diphenyl-5-hydroxy-3-heptanone), 5-hydroxy-7-(4"-hydroxy-3"-methoxyphenyl)-1-phenyl-3-heptanone and 5-hydroxy-7-(4"-hydroxyphenyl)-1-phenyl-3-heptanone; 5TH diarylheptanoid: 7-(4'-hydroxy-3'-methoxyphenyl)-1-phenylhept-4-en-3-one (HMP)

Nine glycosides (1-9): three known glycosides, (1R,3S,4S)-trans-3-hydroxy-1,8-cineole beta-D-glucopyranoside (1), benzyl beta-D-glucopyranoside (3), and 1-O-beta-D-glucopyranosyl-4-allylbenzene (chavicol beta-D-glucopyranoside, 4); and the six novel glycosides, 3-methyl-but-2-en-1-yl beta-D-glucopyranoside (2), 1-hydroxy-2-O-beta-D-glucopyranosyl-4-allylbenzene (5), 1-O-beta-D-glucopyranosyl-2-hydroxy-4-allylbenzene (demethyleugenol beta-D-glucopyranoside, 6), 1-O-(6-O-alpha-L-rhamnopyranosyl-beta-D-glucopyranosyl)-2-hydroxy-4-allylbenzene (demethyleugenol beta-rutinoside, 7), 1-O-(6-O-alpha-L-rhamnopyranosyl-beta-D-glucopyranosyl)-4-allylbenzene (chavicol beta-rutinoside, 8), and 1,2-di-O-beta-D-glucopyranosyl-4-allylbenzene (9)

NARRATIVE

Anti-inflammatory

Many of the abstracts in the library focus on how Lesser Galangal ingredients work to prevent or stop inflammation. Inflammation is a very important part of many diseases of aging, immune dysfunction, autoimmune disease, cancer, and coronary artery disease.

Inflammation is a biochemical/physiological response to injury. No matter what the site of injury is and what the stimulating factor of injury is, inflammation follows certain fixed genetically controlled, biochemically induced reactions that lead to the same biochemical and physiological consequences. From the list of active compounds above, the Diarylheptanoids have been most heavily studied and have the most well defined mechanisms of action. Three abstracts defining these mechanisms have been included for detailed examination.

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Some chemicals created as a result of injury are called proinflammatory mediators of inflammation. Some examples in these studies are called prostaglandins, leukotrienes, nitric oxide, and proinflammatory cytokines like interleukin-1 beta and tumor necrosis factor alpha.

Specific genes which activate production of certain enzymes are also involved. The diarylheptanoids have been shown to block the production of proinflammatory cytokines and the activation of these gene mediated signaling pathways that generate enzymes that in turn create the inflammation. The abstracts chosen to illustrate these points all demonstrate that lesser galangal's active ingredients block inflammation.

Inflammation is a subtle cause of hardening of the arteries or atherosclerosis. So overlapping evidence of anti-inflammatory efficacy impacts upon one of the ways in which lesser galangal inhibits atherogenesis (follow the bullet link above to anti-atherogenic). Lipid peroxidation products cause the cox-2 enzymes to activate an inflammatory response that causes these peroxidation products to be incorporated into inflammatory white blood cells (foamy monocytes) that become a part of atheromatous plaque. The diarylheptanoid abbreviated "HMP" is clearly shown to block lipid peroxidation products, and therefore, inhibit plaque formation.

Antioxidant

One of the causes of inflammation and aging is oxidation of different substances forming high energy and unstable free radicals. These unstable molecules release their oxygen and energy causing destruction. Lesser galangal is shown to be a strong antioxidant and scavenger of free radicals protecting the body.

Lesser galangal is clearly a potent antioxidant. This property is both preventive of atherogenesis and cancer, as well as other degenerative diseases of aging. The N-phenylpropanoids (1-7) listed were demonstrated to be antioxidants.

Lipid peroxidation products cause the cox-2 enzymes to activate an inflammatory response that causes these products to be incorporated into inflammatory white blood cells (foamy monocytes) that become a part of atheromatous plaque. The diarylheptanoid in Lesser Galangal, abbreviated "HMP" is clearly shown to block lipid peroxidation products, and therefore, inhibit plaque formation.

Tumor suppressive/Cancer preventive

As noted above lesser galangal has a high number of active ingredients. These ingredients work simultaneously on different points of attack both to prevent cancer and to suppress tumor growth and metastasis. Follow the text to learn greater detail of each of the mechanisms and the specific classes and ingredients which operate these mechanisms. There are other cancer preventive mechanisms besides its antioxidant properties operating from the ingredients of lesser galangal. Free radical scavenging is one of them by preventing their toxicity to genes.

Apoptosis: Apoptosis is programmed cell death. Any substance that selectively induces apoptosis in cancer cells would be considered useful therapeutically against cancer. Flavonoids galangin and quercetin are main constituents in Lesser Galangal, as stated previously, and for this additional reason of having been proven to induce apoptosis in cancer cells, they are to be considered relevant for consideration as cancer therapeutic agents.

Enhancing anti cancer drug efficacy: In addition to free radical scavenging, lesser galangal ingredients have been shown to enhance the ability of certain cancer fighting drugs to be more available. An example is certain cancer fighting drugs which are applied topically to skin cancers. The drug 5-fluorouracil (5-fu) is one such drug. Volatile oils from Lesser Galangal have been shown to enhance the penetration of 5-fu into the skin, enhancing its cancer fighting ability.

Effect on Fatty Acid Synthase: Compared to normal human tissues, many common human cancers, including carcinoma of the colon, prostate, ovary, breast, and endometrium, express high levels of fatty acid synthase (FAS), the primary enzyme responsible for the synthesis of fatty acids. This differential expression of FAS between normal tissues and cancer has led to the notion that FAS is a target for anticancer drug development. Recent studies with C 75, a drug which is an inhibitor of fatty acid synthesis, have shown significant antitumor activity with concomitant inhibition of fatty acid synthesis in tumor tissue and normal liver. Importantly, histopathological analysis of normal tissues after treatment with this drug showed no adverse effects on normally proliferating cellular compartments, such as bone marrow, gastrointestinal tract, skin, or lymphoid tissues.

The significance of the above referenced studies is that there are 3 components within Lesser Galangal which have been identified to be powerful inhibitors of the enzyme FAS. The inhibition of FAS by galangin, quercetin, and kaempferol, which are the main flavonoids existing in the Galangal, showed that

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quercetin and kaempferol had powerful reversible inhibitory activity without any evidence of slow binding inactivation. An analysis of the kinetic results led to the conclusion that the blocking mechanism of galangal is different from other previously reported inhibitors of FAS like cerulenin, epigallocatechin gallate, and the drug discussed above called C75.

Binds adenosine receptors: Adenosine receptors play a role in a number of processes. Endogenous adenosine may play a role in generating cancer. By binding adenosine receptors galangin, a bioflavonoid of LG may be preventing a cancer causing mechanism.

Free radical scavenging: Free radicals are high energy unstable molecules that cause oxidative damage to genes. When strands of DNA are damaged by free radicals, the damaged parts of DNA are referred to as adducts. When adducts are present within cells in sufficient quantity, this is considered genetic damage, or genotoxicity. When adducts are reproduced during cell division, they create rapidly dividing cells that do not obey the normal signals controlling cellular reproduction. This is a simplified explanation of how a cancer can be formed.

Substances that find and destroy free radicals before they damage genes are called free radical scavengers. This is another aspect of cancer chemoprotection and anti-genotoxicity exhibited by lesser galangal. The class of chemicals in lesser galangal that does this job is called flavones, like galangin and quercetin. When flavones are complexed with zinc they are even more potent scavengers than when they act alone. The results from both in vitro and in vivo studies indicate that galangin with both antioxidative and free radical scavenging ability is capable of modulating enzyme activities and suppressing genotoxicity of chemicals.

Chemoprotection prevents genotoxicity: Another aspect of lesser galangal is its capacity to protect against environmental pollutants and their impact of toxicity on immune system function. Reducing toxicity of unavoidable environmental pollutants helps prevent cancer. This is called cancer chemoprotection. Along these same lines, galangin, a member of the flavonol class of flavonoids is present in high concentrations in Lesser Galangal. The results from both in vitro and in vivo studies indicate that galangin with antioxidative and free radical scavenging ability as well, is capable of modulating enzyme activities and suppressing genotoxicity of chemicals.

COX-2 Inhibition: Flavonoids like galangin, by inhibiting cyclo-oxygenase-2 (COX-2) enzymes can be considered anticarcinogenic. COX-2 –catalysed synthesis of pro-inflammatory prostaglandin E2 plays a key role in inflammation and its associated diseases, such as cancer and cardiovascular disease.

There are reports in the library demonstrating that lesser galangal flavonoids block COX-2 activity. However, in addition, the genetic transcriptional regulation of COX-2 can also be important (Transcriptional regulation means genes on DNA transcribe messenger RNA, which in turn make complex proteins called enzymes). “...., quercetin, quercetin penta-acetate, flavone, resveratrol, .., kaempferol, galangin,...” many of which are in Galangal and have been reported to modulate (down regulate) COX-2 transcription in a wide variety of systems. In addition the following constituents in Lesser Galangal inhibited COX-2 activity:

“Quercetin, quercetin 3-glucuronide, quercetin 3'-sulfate and 3-methylquercetin 3-glucuronide reduced COX-2 mRNA expression in both unstimulated and interleukin-1beta stimulated colon cancer (Caco2) cells. Quercetin and quercetin 3'-sulfate, unlike quercetin 3-glucuronide and 3-methylquercetin 3-glucuronide, also inhibited COX-2 activity.”

What this means is that the process of genetic activation and expression of cox-2 being inhibited reduces the presence of cox-2 enzyme quantity. As well as these same agents blocking its activity, they reduce the presence of cancer producing pro-inflammatory cytokines like PGE2. Less COX-2 with less activity means less cancer producing pro-inflammatory compounds.

Anti-atherogenic (preventive against atherosclerosis)

There are several mechanisms by which ingredients in lesser galangal fight against the formation of atherosclerosis or plaque formation. The many ingredients in lesser galangal diminish the oxidation of critical fats and diminish the formation of inflammation provoking free radicals that contribute to injury to the inside lining of blood vessels large and small. Lesser galangal scavenges free radicals, which means the free radicals are found and destroyed before they do harm. Ingredients in lesser galangal have been shown to reduce the concentration of fats in the serum, like cholesterol and triglycerides. Lesser galangal also reduces platelet stickiness, which helps prevent unwanted clot formation in narrowed arteries. By inhibiting the inflammatory reactions described elsewhere, plaque formation is likewise blocked.

Diminishes lipid peroxidation products and free radical formation: The many ingredients in lesser galangal diminish the oxidation of critical fats and diminish the formation of inflammation provoking free radicals

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that contribute to injury to the inside lining of blood vessels large and small. Peroxidation products that do occur cause the COX-2 enzymes to activate an inflammatory response that causes these products to be incorporated into inflammatory white blood cells (foamy monocytes) that become a part of atheromatous plaque. The diarylheptanoid in galangal abbreviated “HMP” is clearly shown to block lipid peroxidation products, and therefore, inhibit plaque formation.

Scavenges free radicals: Substances that have the ability to find and destroy free radicals before they damage the inside lining of blood vessels are called free radical scavengers. This is another aspect of atherosclerosis protection exhibited by lesser galangal. The class of chemicals in lesser galangal that does this job is the class called flavones, like galangin and quercetin. When flavones are complexed with zinc they are even more potent scavengers than when they act alone. The results from both in vitro and in vivo studies indicate that galangin has antioxidative and free radical scavenging ability as well.

Lowers cholesterol and triglycerides: A well known way to lower risk of hardening of the arteries is to lower serum cholesterol, other lipids, and triglycerides. We include papers which demonstrate Lesser Galangal’s ability to do this. A pancreatic lipase inhibitor called: “HPH” (another diarylheptanoid) lowered cholesterol and triglycerides. Pancreatic Lipase inhibition is a well recognized mechanism to reduce serum lipid concentration.

Inhibits the inflammatory component of plaque formation: Inflammation is one of the subtle causes of hardening of the arteries or atherosclerosis. So overlapping evidence of anti-inflammatory efficacy is one of the ways lesser galangal inhibits atherogenesis.

Antibiotic / antiviral / anti-parasitic / anti-fungal

Lesser Galangal has natural antibiotic/antiviral/antifungal and anti parasite properties that make it useful to treat or prevent infections.

The flavonoids in Lesser Galangal have antiviral, antibacterial, and antifungal properties, and even in one case anti-parasitic properties against the Trypanosome, *T. cruzi*, which contaminates blood supplies in Africa and Asia and causes Chagas disease. These properties have been discovered and explored in depth in abstracts in this library. We present one article demonstrating antiviral properties and six exploring the mechanisms and the susceptible strains of bacteria and one dealing with Chagas disease.

Antiemetic

Although not much is presented in this library, lesser galangal also has shown the property of combating nausea. It is, therefore, considered an anti-emetic.

May enhance anticancer drug efficacy by reducing tumor resistance

In conclusion of the scientific sections, we present one article in which there is a discussion as to how natural herbal substances like lesser galangal may actually work to facilitate pharmaceuticals’ activity against cancer and also protect against the development of resistance to drug efficacy in cancer treatment.

<http://www.yampavalleybotanical.com/herbalabstracts/lessergalangal/library.htm>

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Rosehips Antioxidant Properties

The goal of the Rosehip Research Project is to investigate the scope for commercial production of rosehips, and develop intellectual property related to the health-protective and disease-prevention properties of rosehips.

In order to carry out this work, our researchers will be looking at a number of factors:

rosehips have high levels of antioxidants; http://www.upei.ca/acnbc/html/rosehip_project.html

Rosehip extracts of 18 samples representing six taxa in the genus *Rosa* were evaluated for antioxidant activities by use of different test systems. The ferric-reducing antioxidant power (FRAP) and Trolox-equivalent antioxidant capacity (TEAC) of the crude extracts ranged from 983.4 to 2187.1 $\mu\text{mol FRAP g}^{-1}$ dry matter and from 457.2 to 626.2 $\mu\text{mol TEAC g}^{-1}$ dry matter. The high antioxidant capacity was related to high contents of phytonutrients. The overall mean of antioxidants was 23.23mg g⁻¹ total carotenoids and 76.26 mg g⁻¹ total phenolics. The phenolic component made a major contribution to the total antioxidant activities in both assays (overall mean was 90.5% and 75.7%), whereas the ascorbate made a minor contribution (8.6% and 16.9%) and the lipophilic component made an even smaller one (0.9% and 7.3%). However, the lipophilic component was the most effective when the comparison was based on the ratio of antioxidant activity to content of antioxidants. The crude extracts exhibited 50.9% (46.6-60.3%) inhibitory effect against the lipid peroxidation induced by 2,2'-azobis(2,4-dimethylvaleronitrile) (AMVN) and 85.0% (80.1-90.2%) inhibition in 2,2'-azobis(2-amidinopropane)hydrochloride (AAPH) assay at a concentration of 250 $\mu\text{g ml}^{-1}$. Ascorbate acted as an antioxidant in both peroxy radical-induced lipid peroxidations, but as a pro-oxidant in the metal ion-induced lipid peroxidation. The crude extracts showed a large inhibitory effect in the ferric ion-induced lipid peroxidation and caused 83.7% inhibition at a concentration of 25 $\mu\text{g ml}^{-1}$ dried rosehip powder. <http://cat.inist.fr/?aModele=afficheN&cpsid=803203>

Introduction

Rose hips develop on wild roses as the flowers drop off. The rose hip, also called the rose haw, is actually the fruit of the rose. They are one of the most concentrated sources of vitamin C available, which has led to rose hips being included in many common cold preventives and remedies. While the efficacy of vitamin C in preventing the common cold has been questioned, there's no doubt about the beneficial effects of vitamin C. In addition to C, rose hips also contain A, D and E, as well as antioxidant flavonoids that may reduce the effects of aging and help prevent cancer.

All this is wrapped up in the tart-sweet taste of the miniature fruits. They can be used to make jelly, jam, soup or oil. During World War II, the British government used collected rose hips to make rose hip syrup as a source of vitamin C to replace citrus fruits that were impossible to get.

Summary

Rose hips have a long history of use in traditional medicine. The iron in rose hips make them an excellent supplement for menstruating women, and rose hip tea is a rich source of vitamin C, carrying all the benefits of that vitamin. In addition, the various flavonoids in rose hips have potent antioxidant action, helping to protect the body from the effects of stress, aging and the environment.

<http://www.mountainroseherbs.com/learn/rosehips.php>

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Cran-Max® Antioxidant – UT Support

Cran-Max uses a patented technique to concentrate by 34 times the full spectrum of active factors from the skin, pulps, seeds and juice of whole cranberry. One 500 mg. capsule supplies more organic acids, condensed tannins, OPC's antioxidants and fiber than 10 oz. of cranberry juice cocktail through a natural, sustained release delivery system.

What is Cran-Max®?™

Cran-Max® is made from 100% pure cranberries. It is produced from pure cranberry fiber, infused with cranberry juice concentrate through a proprietary process. This process enhances and intensifies the natural beneficial constituents of the whole cranberry without the addition of sugars, preservatives, flavorings, or coatings. Cran-Max®, therefore, contains all of the nutritional factors present in whole cranberry without the sugar found in cranberry juice beverages.

Health benefits beyond UTIs

American Indians used cranberries as a preparation for dressing wounds. The stanching, antibacterial and healing properties lie in the rich polyphenol content including condensed tannins and smaller OPCs.

Colonial sailors used cranberries to prevent scurvy. Cranberries succeeded due to their rich content of vitamin C and vitamin P constituents (i.e. polyphenols and organic acids).

Significant health benefits are obtained by using the whole cranberry. Ongoing research across the United States focuses on the relationship of the bio-active components in cranberries to urinary tract infections, reduction in malignant tumors, remittance of aggressive cancers and retarding the aging process. The cranberry is an antioxidant cocktail.

Cran-Max® linked with healthy urinary tract

30% of women will have some sort of urinary tract infection this year. Half the women in the world will have had a urinary tract infection (UTI) by the age of thirty. Men are by no means immune. But there is hope. Human trials verify that Cran-Max® can help prevent the occurrence of UTIs. And if a UTI does occur, Vibrant Health's U.T. Vibrance may very well eradicate it. (See page on U.T. Vibrance).

- Cran-Max® has been clinically tested by urologists in ongoing multi-site outcome studies, and has been found to be efficacious in reducing the onset of urinary tract infections and in improving voiding disorder symptoms.
- Cranberry works against bacterial colonization of the bladder.
- Cran-Max® 500 mg. capsules are bioengineered to have unique potency against E. coli and other gram-negative bacteria that cause UTIs.
- The nutritional factors in 500 mg. of Cran-Max® are stronger than those in 10 oz. of cranberry juice cocktail.
- Cran-Max® is made from the complete cranberry — the fruit solids, juice, seeds and skin — using a patent-pending process that supercharges the values found in nature. Unlike other cranberry supplements, Cran-Max® contains the full synergistic spectrum of the whole cranberry and is not just an extract.
- Cran-Max® has a unique delivery system called Bio-Shield™ that increases bioavailability of its cranberry actives. It protects them from degradation while passing through the stomach, and then provides a sustained release of these actives to target sites in the body.
- There are no known side effects or contra-indications if used along with drugs.

Significant health benefits are obtained by using the WHOLE cranberry:

- The distribution of OPCs in cranberry fruit and cocktail is very similar to that found in grapeseed and pine bark extracts.

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- In Cran-Max®, the OPCs are concentrated to exceed the potency of pine bark extracts (60%) and match the finest grapeseed extracts.
- Cran-Max® is a better free radical scavenger than Vitamin E or cranberry juice.
- Ellagic acid is a highly significant component of Cran-Max®. Ellagic acid is known to kill cancer cells outright and has therapeutic value at dosages as low as 8 milligrams per day. One 500 mg. capsule of Cran-Max® should deliver at least 8.5 milligrams of ellagic acid.

Cran-Max® has been shown to nutritionally support healthy urinary tract function by inhibiting the ability of E. coli bacteria to adhere to the linings of the urinary tract. Earlier studies had shown that 10 oz. of cranberry juice cocktail has a positive effect on maintaining a healthy urinary tract. One Cran-Max® capsule has greater bioactivity and more concentrated whole cranberry factors than 10 oz. of cranberry juice cocktail. *

Cran-Max® Whole Cranberry Components				
Polyphenols:	Organic Acids:	Minerals & Vitamins:	Dietary Fibers:	Total Carbohydrates:
Proanthocyanidins Anthocyanidins & OPC's	Hippuric, Ellagic, Shikimic, Quinic, & Citric acids	Vitamin A & C, Calcium, Iron, Copper, Magnesium, Niacin, Malic, Benzoic, Phosphorus, Potassium, Riboflavin, Sodium, Thiamin & Zinc	4.45 g / 100 g	10.39 g / 100 g

<http://www.vibranthealth.org/cranmax.html>