

QUANTITATIVE ANALYSIS OF VITAMIN C-COMPLEX

Found in Embryonic Plant Extracts

by
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A Ratio Concentration of 1:10 is a 10% of what a crude plant extracts are and considered a classical homeopathic mother tincture (MT) the script form is a circle with a forward slash \emptyset . This 1:10 concentration has a greater advantage over the use of adult crude plant extracts, which are full of residual plant debris that serves no therapeutic benefits. In fact, crude plant extracts add an unnecessary burden to the body getting rid of this non beneficial plant debris. Furthermore, when a plant extract is too crude or not sufficiently using high alcohol percentage, you can end up with too many undissolved tannins and having an inferior concentration of bioactive phytochemicals present in the finished product. Vegetable glycerine is also an important solvent for the extraction and stabilization of some phytochemicals preventing them from oxidation.

Mother tinctures (MT) with or without glycerine are considered the pharmaceutically graded standard of homeopathic classic MT, from which all homeopathic dilutions are made from and, which many phytotherapists used them full strength.

The French Pharmacopeia of the past did extensive research studies regarding classical mother tincture and what was best suited from a pharmacological point of view. They concluded that across all types of herbal maceration concentration, methods used, solvency used that mother tinctures were superior for their unsurpassed ability for osmosis rather than what was observed from a crude plant extract lacking in its phytochemical bioavailability. This is how mother tinctures were established by the French Homeopathic Pharmacopeias and how we came to know these conclusions in regard to their concentration best for pharmaceutical purposes.

Whereas, even today the thinking remains in terms of megadose the belief that more is more, when, in fact, the total opposite is true that more is less if the absorption (osmosis) permeability-bioavailability is inferior. Furthermore, that isolated synthetic analogue in megadose is not what is observed when obtained from nature. It is the total sum of a plant composition that is increasingly being shown effective and responsible for its biological activities contrary to any isolated synthetic analogue either void of bioactivity or increasing the likelihood of adverse side effects.

Many research studies report erroneous conclusions regarding a particular plant biological activities or adverse events. In these studies, they often omit to list the type of solvent being used. For instance, DMSO a floor solvent being used is known to disrupt estrogen receptors resulting in estrogen dominance and not the phytochemical being the culprit for such a negative reporting and at that given in megadose. This is not the way it is found in nature in such high amounts and works very differently than what is observed from synthetic source. In fact, they are not even studying plants altogether, and you cannot compare isolated synthetic analogue with the total sum of a plant composition. Rarely is it a case of one phytochemical being responsible for one particular biological activity but the synergy of many all contributing to a specific activity.

Most embryonic plant extracts are delivered at 5% half of a classical mother tincture having a ratio of 1:20 and some are delivered at a 1:10 concentration, being a 10% classical mother tincture. The reason for a 1:10 concentration is for when a higher dose is required making it more practical and more economical. And also for when a plant was shown to be less active in a 1:20 concentration needing higher dosage. Most embryonic plants are even more potent at a 1:20 concentration and studies have shown to require only one-third the dose of an adult plant extracts to provide superior pharmacological activities. Dosage varies from 5-30 gtts, tid and with adult, phytotherapy requires 15-90 gtts tid depending on the plant species the severity for which it is being used and response to a chosen dose (posology).

In general adult plant extracts ratio are from 1:1 to 1:5 and to think that 1:10 or 1:20 is more potent may seem at first illogical but repeated analysis by independent laboratories and by two European Universities; Bari from Italy and Liege from Belgium, all confirmed that not only does embryonic plant extracts contains all of the phytochemicals from every different plant organs tissues of the future plants but was found to be present in higher concentration. This was done on various batches with reproducible results. It is as if embryonic plant extracts were nature way for standardized extractions. This is also why young vibrant plant tissues are more active at a lesser ratio concentration. Intolerance have been noted to occur when the concentration is higher than 1:10 like that of 1:1 to 1:5.

When an embryonic plant extracts containing vitamin C-complex, they are more readily bio-absorbable, contrary to manmade synthetic ascorbic acid analogue, of which fortunately, most people urinate 90% of it explaining in part the lack of therapeutic benefits against the common colds. They are Fractionated = Synthetic = Crystalline = Unnatural. Natural plant-source vitamins are enzymatically alive. Manmade synthetic vitamin's analogues are void of enzymatic activity and works like that of a drug. Most sources equate vitamin C with ascorbic acid, as though they were one within the same thing.

Ascorbic acid (C₆H₈O₆) is an organic acid derived from carbohydrate. It is also known as Antiscorvic vitamin, Antiscorbutic vitamin, L(+)-Ascorbic acid, L-threo-hex-2-enonic acid, gamma lactone, 3-keto-L-gulofuranolactone, L-3-ketothreohexuronic acid lactone, 3-oxo-L-gulofuranolactone and L-xyloascorbic acid.

L-ascorbic acid is only one fraction of the total sum vitamin C-complex. Because it is derived from glucose, many animals are able *de novo* produce it, but humans cannot and require to be obtained as part of their daily diet. It is needed by the body to form collagen

in bones, cartilage, muscle, and to maintain blood vessels. The adrenal glands have an enormous need for vitamin C-complex like no other glands. Ascorbic acid by itself is a weak antioxidant when not part of the full-spectrum vitamin C-complex composition.

The human body does not favor oral ascorbic acid alone this is why most of it, is quickly excreted. The body rather wants and needs the C-complex that is protected by it. The vitamin C-complex is so much more important than ascorbic acid the armor of the lymphocytes. Lymphocytes without the full-spectrum vitamin C-complex will inevitably be impotent, fail to function, and be unable to fight off infectious organisms. The potency of lymphocytes is also linked to copper, the trace mineral found at the core of the tyrosinase enzyme activity. Organic copper, functioning as the tyrosinase enzyme, and the most active factor of the vitamin C-complex. Scientific research has shown that a relationship exists between ineffective lymphocytes and copper deficiency.

These lymphocytes that lack copper as well as the ability to kill pathogens may actually be lacking the entire vitamin C-complex, which contains copper. Such ideas are ignored because vitamin C is not detected in lymphocytes. Why isn't vitamin C recognized on the lymphocyte? Well, researchers recognize vitamin C as ascorbic acid, which is shed in the human body and not taken up by the lymphocyte with the rest of the C-complex. Thus no ascorbic acid equates to no vitamin C; according to them.

Ascorbic acid is not a vitamin and I suspect that many other supplements out there, full of synthetic analogues cannot duplicate actual vitamins, since they are severely lacking as is the case in replacing the vitamin C complex with ascorbic acid. Ascorbic acid is also 10 times more acidic than the naturally occurring vitamin C-complex.

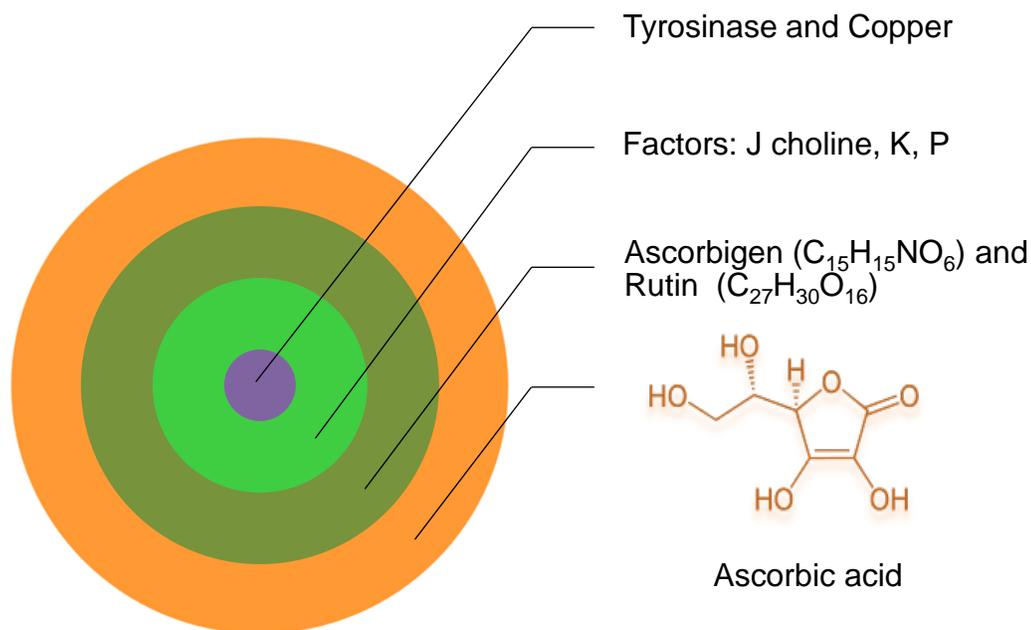
We now know that vitamin C-complex is an integral part for the production and maintenance of collagen, a protein or "glue" that holds the body's cells in place. It is indispensable to bones metabolism, teeth, and blood vessels, brain and adrenal glands as well for wounds healing. Furthermore, vitamin C-complex helps to metabolize several amino acids and hormones. Only when obtained from a natural source with the full-spectrum vitamin C-complex can it be a powerful antioxidant, at a fraction of the concentration of ascorbic acid alone, assisting the body rid itself of carcinogenic by-products called free radicals and xenobiotics. There's even strong evidence that vitamin C-complex may raise blood the levels of high density lipoprotein (HDL), reducing the risk of cardiovascular disease associated with diabetes.

In milligram amounts; Vitamin C-complex is more potent and effective than that of ascorbic acid alone. It only requires 1/10 the amount of ascorbic acid alone for Vitamin C-Complex to give superior results. In other words, manmade ascorbic acid is void of any real health benefits since 90 percent of it is rapidly excreted out of the body. For very good reasons the body rids itself of synthetic ascorbic acid rapidly, since it views ascorbic acid as a foreign compound whereas, natural Vitamin-C-complex is nearly 100 percent absorbed.

Only in the past decade have we understood the importance of obtaining vitamin C from nature either from plants or food, rather than from its purified synthetic ascorbic acid analogue. In nature, true Vitamin C-Complex is a comprehensive matrix of many compounds it contains: ascorbic acid, ascorbigen which is formed by indole-3-carbinol and ascorbic acid, it must contain at least one polyphenol flavonoid sub class flavonol

Rutin (Quercetin-3-O-rutinoside) or the flavanone glycoside hesperidin (Hesperetin 7-rutinoside) to have full activity by either rutinosides, these in the past were referred to vitamin P; it also contains factor J choline, vitamin K, and the enzyme Tyrosinase organically bound copper in an oligo-element amount is sufficient for the full-spectrum vitamin C-complex.

Myrciaria dubia - Camo Camo (Peru), also known as Camu-camu (fruits) contains the highest amount of ascorbic acid 20,890 - 499,000 ppm and **Acerola** - Malpighia glabra L. (fruits) also contains very high amounts of ascorbic acid 16,228 - 172,231 ppm. However, both of these fruits lacks in the necessary co-factors for the full spectrum of Vitamin C-complex biological activities.



Vitamin C-complex full spectrum

Ascorbic acid synthetic analogue: (5*R*)-[(1*S*)-1,2-dihydroxyethyl]-3,4-dihydroxyfuran-2(5*H*)-one. D-ascorbic acid which does not occur in nature can be made synthetically. L-ascorbate is known to participate in many specific enzyme reactions, which require the correct epimer (L-ascorbate and not D-ascorbate). However, being a good electron donor, excess ascorbate in the presence of free metal ions cannot only promote but also initiate free radical production, thus making it a potentially dangerous pro-oxidative compound in certain metabolic contexts.

Ascorbic acid solution is rapidly oxidized in air and alkaline media. Ascorbic acid gradually darkens upon exposure to light. Even in the absence of light, ascorbic acid is gradually degraded on exposure to a humid atmosphere, the decomposition being faster at higher temperatures. In concentrations greater than 100 mg/mL, ascorbic acid may undergo decomposition with the production of carbon dioxide.

Synthetic ascorbic acid is contraindicated in patients with hyperoxaluria and glucose-6-phosphate dehydrogenase (G-6-PD) deficiency.

Methods of Ascorbic Acid Manufacturing

They are two industrial methods used to produce ascorbic acid synthetically employ the GMO corn starch source sugar glucose. The Reichstein process was developed in the early 1930s and uses a short fermentation process, followed by chemical processing: Glucose > Sorbitol + fermentation > Sorbose > Diacetone-Sorbose > Keto-Gulonic acid > Keto-Gulonic acid methylester > Ascorbic acid.

Another improved method used a two-step fermentation process that was developed in China in the 1960s: Glucose > Sorbitol + fermentation > Sorbose + fermentation > Keto-Gluconic acid > ascorbic acid. Most ascorbic acid is currently produced in China using this method and there are only a couple of manufacturers outside of China producing ascorbic acid.

Specific steps in the manufacturing of synthetic ascorbic acid analogue

First step is GMO corn syrup (nothing but refined pure corn sugar). Then follow these chemical steps:

Steps 1 thru 9 Starch Hydrolysis: GMO corn starch is broken down into simple sugar (D-Glucose) by the action of heat and enzymes, which destroys some of it.

Step 10 Hydrogenation: D-Glucose is converted into D-Sorbitol.

Step 11 Fermentation: D-Sorbitol is converted into L-Sorbose.

Step 12 Acetonation: they use acetone. L-Sorbose is combined with an acid at low temperatures.

Step 13 Oxidation: The product is then oxidized with a catalyst, acidified, washed and dried forming L-Gluconic acid.

Step 14 Hydrolysis: L-Gluconic acid is treated with hydrochloric acid forming crude ascorbic acid.

Step 15 Recrystallization: then the crude ascorbic acid is filtered, purified and milled into a fine crystalline powder.

Semi synthetic ***intravenous source of ascorbic acid*** can be derived from GMO corn, tapioca, beets and the plant Cassava.

Synthetic ascorbic acid source has been shown to destroy beneficial probiotic bacteria in the human gut and to cause oxidative stress. Furthermore, both ascorbic acid and vitamin C-complex is destroyed by heat.

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Ascorbic acid supplements can speed up the process of arteriosclerosis. Cancer thrives on glucose and ascorbic acid can also cause DNA damage.

The Nobel Prize Laureate in Medicine, Dr. Albert Szent-Gyorgi, who discovered Vitamin C, reportedly said that “ascorbic acid simply cannot confer vitamin activity.” Unfortunately, almost every supplement sold today only contains ascorbic acid fractional reproductions and not the whole food, natural form.

When we look at the schematic of the whole Vitamin C Complex, you can see that the flavonoid complexes, enzymes and organic copper, and the other nutritional factors like P, J, and K make up the whole composition of vitamin C complex architecture. When we consume the whole vitamin C complex from plants, things can really start to take place like that of:

- Blood vessels begin to strengthen
- Bones take up calcium and other minerals properly
- Capillaries firm up and bleeding stops
- Gingivitis bleeding gums stop, teeth tighten
- Immune system enhancement, can be measured on lab and other tests
- It improves circulation to the heart, more oxygenation of the blood, and results in better heart function
- Oxygenation of the cells becomes more efficient
- It stimulates collagen production
- The adrenal glands function greatly improves

You will observe in the next table that it is not because a plant contains a high amount of ascorbic acid that it is an effective vitamin C-complex, unless it also contains its co-factors most important for its total biological activities.

Vitamin C-Complex Synergists: Nickel, Iron, Phosphorus, Germanium, Selenium, Tin, Vitamin A, Adrenals, Cobalt, Vitamin B₁₅.

Vitamin C-Complex Antagonists: Manganese, Zinc, Calcium, Vitamin E, Copper (when in toxic or very high amounts), Cobalt, Vitamin B₁₂, Estrogen.

Quantitative Analysis of Natural Vitamin C-Complex Found in Medicinal Embryonic Phytotherapy (MEP)		
Plant Names	Ascorbic acid	The rest of the complex
Walnut – Juglans Regia (buds) 1:10	8,000 - 13,000 ppm per 10 drops equal 8 - 13 mg. Although it does contain more ascorbic acids, the total flavonoids composition of walnut does not meet the requirement of a true vitamin C-complex that Black currant possesses.	Does not contain the full-spectrum vitamin C-complex. Having half the activity 4.0 to 6.5 mg.
Walnut – Juglans Regia (buds) 1:20	4,000 - 7,500 ppm per 10 drops equal 4.0 - 7.5 mg.	Looking at half the activity 2 to 3.25 mg of activity since

		it does not contain any Rutinosides.
Dog Rose – Rosa Canina (young shoots) 1:20	12,500 ppm per 20 drops equal 12.50 mg. 6,250 ppm per 10 drops equal 6.25 mg. Although its ascorbic acid content is higher than Black currant, its total composition does not contain Rutin making it insufficient for the full interactive synergy of vitamin C-complex.	Does not contain the full-spectrum vitamin C-complex. Half the activity of vitamin C-complex, which is for 20 drops 6.25 mg and for 10 drops 3.13 mg.
Black Currant – Ribes Nigrum (buds) 1:10 It remains the <i>Polycrest</i> Vitamin C-Complex due to its total phytochemicals composition. It also contains everything that the adrenal glands could ever possibly require, including those three oligo-elements Cu, Mg and Zn and lots of Tyrosinase enzymes activity how incredible is this?	10,030 ppm, per 10 drops equal 10.03 mg. The Total Vitamin C-Complex = 14.90 mg per 10 drops. Full-Spectrum Vitamin C-Complex Biological Activities. Tyrosinase carries out the oxidation of phenols such as tyrosine and dopamine using dioxygen (O ₂). Type III copper centres (T3Cu) consist of a pair of copper centres , each coordinated by three histidine residues.	Flavonoids complex with Rutin total 4,600 ppm or 4.6 mg . The composition of Black currant bud extracts does contain the total full spectrum of vitamin C-complex making it the <i>Polycrest</i> by the mere facts of its total composition.
Black Currant – Ribes Nigrum (buds) 1:20	5,015 ppm per 10 drops equal 5.05 mg. The Total Vitamin C-Complex = 7.45 mg per 10 drops.	Flavonoids complex with Rutin total 2,300 ppm or 2.3 mg . The composition of Black currant bud extracts does contain the total full spectrum of vitamin C-complex making it the <i>Polycrest</i> by the mere facts of its total composition.
Horsetail – Equisetum Arvense (young shoots) 1:20	7,937 ppm per 20 drops equal 7.93 mg.	Flavonoids are Isoquercitrin, Isoquercitroside and Kaempferol and two Luteolin but no Rutin.

	<p>The Total Vitamin C-Complex = 13.93 to 17.63 mg per 20 drops.</p> <p>The Total Vitamin C-Complex per 10 drops = 69.65 – 88.15 mg.</p>	<p>However, it does contain a high amount of Silica 60,000 - 97,000 ppm, or 60.0 - 97.00 mg., which this replaces rutin in the synergy of Vitamin C-complex increasing bone metabolism and the stimulation of collagen production osteoblast – osteogenic activity.</p>
Mistletoe – Viscum Album (young shoots) 1:20	7,500 ppm per 20 drops equal 7.50 mg.	Flavonoids are Quercetin-3-Arabinoside, Quercetin-3-O-Rhamnoside and Quercitol but not Rutin. However, it does contain silicon, which also assists in the synergy of vitamin C-complex for collagen activity on bone metabolism.
Lemon Tree – Citrus Limonum (bark) 1:20 <i>Polycrest</i>	5,566 ppm per 20 drops equal 5.56 mg. Hesperidin (C ₂₈ H ₃₄ O ₁₅) 68,800 ppm or 68.0 mg (Hesperetin 7-rutinoside) The Total Vitamin C-Complex = 73.56 mg per 20 drops.	Contains two Flavonoids Hesperidin and Rutin and although the ascorbic acid is in a smaller amount, it does possess the full-spectrum vitamin C-complex.
Grape Vine – Vitis Vinifera (buds) 1:10	3,870 ppm per 10 drops equal 3.87 mg.	Flavonoids with Rutin and although the ascorbic acid is in a smaller amount, it does possess the full-spectrum vitamin C-complex.
Grape Vine – Vitis Vinifera (buds) 1:20	1,935 ppm per 10 drops equal 1.935 mg.	Flavonoids with Rutin and although the ascorbic acid is in a smaller amount, it does possess the full-spectrum vitamin C-complex.
Raspberry – Rubus Idaeus (young shoots) 1:20	3,670 ppm per 20 drops equal 3.67 mg.	Flavonoids Kaempferol-3-Beta-Glucuronide and Quercetin-3-Beta Glucuronide but no Rutin.

		Although it does contain other synergist's oligo-elements for full-spectrum vitamin C-complex.
Yarrow – Achillea Millefolium (young shoots) 1:20	3,100 ppm per 20 drops equal 3.10 mg.	Contains the full-spectrum vitamin C-complex.
Mountain Pine – Pinus Montana (buds) 1:20	3,000 ppm per 20 drops equal 3.00 mg.	Does not contain the full-spectrum vitamin C-complex.
Crab Apple – Malus Sylvestris (buds) 1:10	2,855 ppm per 10 drops equal 2.85 mg.	Contains the full-spectrum vitamin C-complex.
Nigella – Nigella Sativa (germinating seeds) 1:20	2,577 ppm per 20 drops equal 2.57 mg. And also contains: Dehydroascorbic acid 2.95 ppm.	Does not contain the full-spectrum vitamin C-complex.
Dandelion – Taraxacum Officinale (embryonic roots) 1:10	2,430 ppm per 10 drops equal 2.43 mg.	Does not contain the full-spectrum vitamin C-complex.
Purple Coneflower – Echinacea Purpurea (embryonic roots) 1:20	2,140 ppm per 20 drops equal 2.14 mg.	Contains the full-spectrum vitamin C-complex.
Fig – Ficus Carica (buds) 1:20	2,013 ppm per 20 drops equal 2.03 mg. The Total Vitamin C-Complex = 3.01 mg per 20 drops.	Contains the full spectrum vitamin C-complex. Rutin 1,000 ppm.
Cowberry – Vaccinium Vitis Idaea (young shoots) 1:20	1,865 ppm per 20 drops equal 1.86 mg.	Does not contain the full spectrum vitamin C-complex.
Hawthorn – Crataegus Oxyacantha (buds) 1:20	1,800 ppm per 20 drops equal 1.80 mg.	Contains the full-spectrum vitamin C-complex.
Black Elder – Sambucus Nigra (buds) 1:20	1,782 ppm per 20 drops equal 1.782 mg. The Total Vitamin C-Complex = 10.0 mg per 20 drops.	Contains the full spectrum vitamin C-complex. Rutin 9,200 ppm or 9.2 mg.
Bilberry – Vaccinium Myrtillus (young shoots) 1:20	1,650 ppm per 20 drops equal 1.65 mg	Does not contain the full-spectrum vitamin C-complex.
Lilac – Syringa Vulgaris (buds) 1:20	1,315 ppm per 20 drops equal 1.31 mg	Contains the full spectrum vitamin C-complex.

St. John's Wort – Hypericum Perforatum (buds of flowers) 1:20	1,300 ppm per 20 drops equal 1.30 mg	Contains the full-spectrum vitamin C-complex.
Sour Cherries – Prunus Cerasus (buds) 1:20	873 ppm per 20 drops equal 0.873 mg	Contains the full-spectrum vitamin C-complex.
Rosemary – Rosmarinus Officinalis (young shoots) 1:20	673 ppm per 20 drops equal 0.673 mg	Does not contain the full-spectrum vitamin C-complex.
Juniper – Juniperus Communis (young shoots) 1:20	350 ppm per 20 drops equal 0.35 mg	Does not contain the full-spectrum vitamin C-complex.

Deficiency Symptoms

Severe deficiency of course results in well-known scurvy, an acute or chronic disease characterized by hemorrhagic manifestations and abnormal osteoid and dentin formation. In adults, primary deficiency is usually caused by improper diet. Deficiencies occur in gastrointestinal diseases, pregnancy, lactation, and thyrotoxicosis increase the need for vitamin C-complex requirements. Acute and chronic inflammatory diseases (IBD), surgery, and burns can significantly increase requirements. Diarrhea increases fecal loss, and achlorhydria decreases the amount absorbed. Cold or heat and stress increases urinary excretion of vitamin C-complex. Heat (eg, sterilization of formulas, cooking) can destroy vitamin C-complex content of food.

Vitamin C is a very poorly misunderstood vitamin and somewhere along the line it was decided any vitamin C product can be rated according to the amount of ascorbic acid it contains. Alone ascorbic acid is a weak antioxidant. It is the preservative part of the vitamin C-complex. The real vitamin C complex contains the P factors Rutin or Hesperidin, which maintain vascular integrity.

Vitamin K is another part of the C complex. It promotes prothrombin, which helps in coagulation (blood clotting). Another factor J which is the part of the vitamin C-complex which increases the oxygen carrying capacity in the blood. If you have a cold, you want to get oxygen to your tissues where it oxidizes the toxins and carries them off as carbon dioxide and water.

Vitamin C-complex contains enzymes, one being tyrosinase. Organic copper, an adrenal activator. I have found that plants containing the most tyrosinase produce the best clinical results. The circulation and proper utilization of copper in the body requires a good functioning liver, gall bladder and adrenal glands. If any of those organs are impaired, the body cannot properly excrete and utilize copper.

Please note that the suffix –ase- in tyrosinase; this suffix nearly always denotes an enzyme.

Tyrosinase is a copper-containing oxidoreductase enzyme found in plant and mammal tissues that catalyzes the oxidation of tyrosine into melanin and other dark pigments. This enzyme is involved in the production of brown and black pigments (melanin) through oxidation of tyrosine. The lack of tyrosinase activity is responsible for albinism.

In plants all tyrosinase have in common a binuclear, type 3 copper centre within their active sites. Here, two copper atoms are each coordinated with three histidine residues.

Several polyphenols, including some flavonoids and stilbenoids, are free radical scavengers, and copper chelators, and have been shown to be tyrosinase inhibitors. But when part of a total plant composition works more of a tyrosinase modulator, only when isolated are they strictly tyrosinase inhibitor not having other phytochemicals which contains tyrosinase enzymes activity. The problem always exists when phytochemicals are obtained from synthetic isolated analogue source. So far no man has been able to duplicate the *bipolar aspect of plant phytochemistry* serving more a role of chemicals modulation for human chemical imbalances achieving chemical and hormonal homeostasis.

The Connection between Copper Overload and Adrenal Insufficiency

If copper build up it will interfere with proper conversion of thyroid hormone at the cellular level. It also causes a zinc imbalance, interfering with adrenal hormone production and this also lowers our immune system. The impairment of both the thyroid and adrenal glands function causes the most common copper toxicity symptom of fatigue. All toxic metals can accumulate in toxic amounts and contribute further to adrenal fatigue. When the adrenal function is reduced, copper retention greatly increases. Only when copper is given in oligo-element informative dosages is it beneficial for the sequestration of encapsulated copper releasing the entrapment and accumulation recirculating it for its proper utilization. Minerals are so important to activate enzymes production. Copper is part of some enzymes driving oxidative and reduction process. It is a necessary element for protein synthesis, iron absorption and red cells (RBC's) production. Copper is an anti-infectious agent for both bacteria and viruses, because it stimulates the immune reticulo-endothelial system and helps in the regulation of both the thyroid and adrenal glands.

The more stress we experience, the more likely we will be prone to copper excess or zinc deficiency, which can be a contributing factor to adrenal insufficiency. During acute period of stress, the loss of zinc and magnesium is increased and the retention of copper serve the body, to improve the adrenal response to stress. Copper toxicity reduces our ability to cope with stress in a normal fashion.

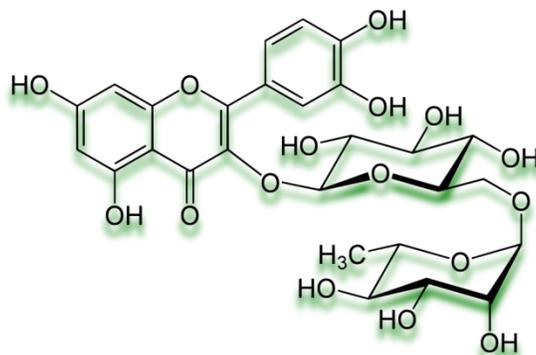
The adrenal glands are essential for good working immune system and zinc is mandatory for the adrenal glands production of cortical hormones; aldosterone and cortisol. Sodium and potassium accelerate the metabolism by regulating the adrenocortical hormones.

Sodium and potassium are two great solvents in the body. When the sodium and potassium decline in slow oxidation, minerals begin to drop out of solution and precipitate into the tissues and can contribute to arteriosclerosis plaque formation and accelerated aging.

Vitamin C-Complex biological activities include: acidulant, aldose-reductase-inhibitor, analgesic, angiotensin-receptor-blocker, anti-hypoadrenal, anti-AGE, anti-CFS, anti-CTS, anti-Crohn's, anti-Lyme, anti-Raynaud's, antiaggregant, antiaging, antiallergic, antiAlzheimeran, antiarthritic, antiasthmatic, antiatherosclerotic, antibacterial, anticataract, anticataract, anticataract, anticervical dysplasia, anticlimatric, anticold, antidecubitic, antidementia, antidepressant, antidiabetic, antidote (aluminum, cadmium,

lead, and paraquat), antieczemic, antiedemic, antiencephalitic, antiendometriotic, antifatigue, antifibrotic, antigallstone, antigastritic, antigingivitic, antiglaucomic, antigout, antihangover, antihemorrhagic, antihepatitic, antihepatotoxic, antiherpetic, antiherpes zoster, antihistaminic, antihypertensive, anti-ischemic, antifertility, antiinflammatory, antileprosy, ant lithic, antimaculitic, antimeasles, antimenopausal, antimigraine, anti-mononucleosis, antimutagenic, antineuramidase, antinitrosic, antiobesity, antiorchitic, antiosteoarthritic, antiosteoporotic, antioxidant, antiparkinsonian, antiparotitic, antiperiodontitic, antipneumonic, antipodriac, antipoliomyelitic, antipyretic, antiradicular, antiretinotic, antirheumatic, antirhinitic, antiscorbutic, antiseptic, antispasmodic, antistress, antistroke, antisynndrome-X, antitumor (gastric, lung), antiulcer, antiviral, apoptotic, beta-adrenergic receptor blocker, beta-glucuronidase-inhibitor, calcium-antagonist, cancer-preventive, cardioprotective, collagenic, detoxicant, diuretic, fistula-preventive, hypocholesterolemic, hypoglycemic, hypotensive, immunomodulator, immunostimulant, interferonogenic, lithogenic, mucolytic, pesticide, uricosuric, urinary-acidulant, vasodilator and a vulnerary.

Quercetin-3-O-rutinoside (Rutin) ($C_{27}H_{30}O_{16}$) is the glycoside between the flavonol quercetin aglycone and the disaccharide rutinose (α -L-rhamnopyranosyl-(1 \rightarrow 6))- β -D-glucopyranose). It is also known as Rutoside, Quercetin-3-O-sophoroside, Phytomelin, Sophorin, Birutan, Eldrin, Birutan Forte, Rutin trihydrate, Globularicitrin and Violaquercitrin. The synthetic analogue: 2-(3,4-dihydroxyphenyl)-5,7-dihydroxy-3-[α -L-rhamnopyranosyl-(1 \rightarrow 6))- β -D-glucopyranosyloxy]-4H-chromen-4-one.



Quercetin-3-O-rutinoside (Rutin)

Rutin is a chemical compound part of the vitamin C-complex. Rutin inhibits both the complement alternative and classical pathways. In humans, Rutin attaches to the iron ion Fe^{2+} , preventing it from binding to hydrogen peroxide, which would otherwise create a highly reactive free radical that can damage the cells. Rutin inhibits platelet aggregation, as well as decreases capillary permeability, rendering the blood thinner and improving collateral circulation.

Inhibit vascular endothelial growth factor in sub toxic concentrations, so acts as an inhibitor of angiogenesis in the control of some cancers.

It inhibits platelet aggregation, as well as decreases capillary permeability, making the blood thinner and improves collateral circulation. Prevent blood clot's formation, thereby preventing the risk of heart attacks and strokes. Effective for the treatment of hemorrhoids, varicosities, macroangiopathy and for chronic venous insufficiency (CVI).

Thyroid iodide uptake through the sodium-iodide symporter (NIS) is not only an essential step for thyroid hormones biosynthesis, but also fundamental for the diagnosis and treatment of different thyroid diseases. However, part of patients with thyroid cancer is refractory to radioiodine therapy, due to reduced ability to uptake iodide, which greatly reduces the chances of survival. Therefore, compounds able to increase thyroid iodide uptake are of great interest.

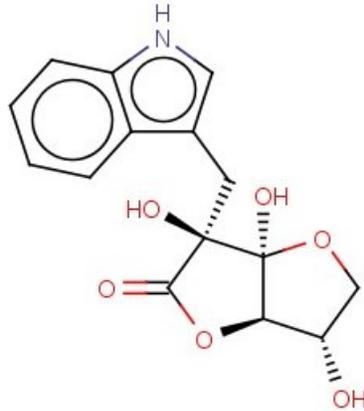
Recently, a study has shown *in vivo* that among all flavonoids tested, rutin was the only one able to **increase thyroid iodide uptake**. Rutin led to a slight reduction of serum T-4 and T-3 without changes in serum thyrotropin (TSH), and significantly increased hypothalamic, pituitary and brown adipose tissue type 2 deiodinase and decreased liver type 1 deiodinase activities. Moreover, rutin treatment increased thyroid iodide uptake probably due to the sodium-iodide symporter (NIS) expression, which might be secondary to increased response to TSH, since TSH receptor expression was increased. Thus, rutin might be useful as an adjuvant in radioiodine therapy, since this flavonol increased thyroid iodide uptake without greatly affecting thyroid function.

In veterinary medicine it is used in the management of chylothorax in dogs and cats. A type of pleural effusion. It results from lymphatic fluid (chyle) accumulating in the pleural cavity.

Summary of Rutin biological activities include: 5-HT-inhibitor, aldehyde-oxidase-inhibitor, aldose-reductase-inhibitor; allelochemical, antiaggregant, antiallergic, antiapoplectic, antiatherogenic, antiatherosclerotic, antibacterial, anticancer, anticapillary-fragility, anticataract, anticlastogen, anticonvulsant, antidementia, antidermatitic, antidiabetic, antiedemic, antierythemic, antifeedant, antiglaucomic, antihematuric, antihemorrhoidal, antihepatotoxic, antiherpetic, antihistaminic, antihypoxic, antihypertensive, anti-inflammatory, antimalarial, antimelanomic, antimetastatic, antimutagenic, antinephritic, antinociceptive, antioxidant, antiplatelet, antiproliferant, antiprotozoal, antipurpuric, antiradicular, antispasmodic, antisunburn, antithrombogenic, antitrypanosomic, antitumor, antiulcer, antivaricose, antiviral, apoptotic, cancer-preventive, capillariprotective, catabolic; chemopreventive, cytoprotective, hemostat, hepatomagenic, hepatoprotective, hypocholesterolemic, hypotensive, immunomodulator, insecticide, juvabional, larvostat, lipoxygenase-inhibitor, myoprotective, myorelaxant, neuroprotective. Oviposition-stimulant, PAF-inhibitor, pesticide, protisticide, radioprotective, sunscreen, Topoisomerase-II-Inhibitor, vasodilator, vasopressor, cAMP-Phosphodiesterase-inhibitor.

Ascorbigen (ABG) (C₁₅H₁₅NO₆) also known as alpha-L-lyxo-3-Hexulofuranosonic acid, 2-C-(1H-indol-3-ylmethyl)-, gamma-lactone, mixture with 2-C-(1H-indol-3-ylmethyl)-alpha-L-xylo-3-hexulofuranosonic acid gamma-lactone. It is formed by indole-3-carbinole and ascorbic acid. The synthetic analogue: 2-C-(1H-Indol-3-ylmethyl)-β-L-lyxo-3-hexulofuranosonic acid g-lactone.

The content of ascorbigen in plant was determined at 6-hr. intervals over a period of 3 sunny days. A periodic rise and fall of ascorbigen content was noted in the growing stem and young buds of leaves with maximum content at 6 P.M. and minimum at 6 A.M. Therefore, Black currant buds are best harvested around 6 P.M.



Ascorbigen

The work by Gmelin and Virtanen in 1961, concerning the isolation and elucidation of the structure of glucobrassicin, and its reaction with ascorbic acid in the presence of the enzymes myrosinase gives a very rapid rise to ascorbigen.

Ascorbigen is formed by indole-3-carbinole and ascorbic acid. Ascorbigen for the treatment of fibromyalgia and preventing breast cancer, cervical dysplasia, antiaging, immunomodulator, P450 enzyme activities and ultraviolet-protective properties. ABG may partly mediate the known anticarcinogenic effect. It prevents toxins from being absorbed through the small and large intestines. Ascorbigen is a skin-permeable form part of the Vitamin C complex. Ascorbigen gives the skin extra smoothness, firmness and a more youthful-appearance. The skin also gets important protection against environmental pollution, free radicals and sun damage it provides corrective action against past skin damages.

ABG modulate estrogen metabolism, decreasing the amount of one relatively potent estrone (16 α -hydroxyestrone) while increasing the production of another less active estrone (2-hydroxyestrone), in a majority of women. The rationale for testing dietary indoles in fibromyalgia is that dietary indoles modulate estrogen metabolism and FMS is very much more common in women as with a number of related disorders such as lupus, Rheumatoid Arthritis, and Sjögren's.

Ascorbigen has been shown to be cytotoxic to melanoma, HepG2 and colon cancer cell lines by a mechanism of inhibition matrix metalloproteinases (MMPs) elevation seen in malignancies: ascorbigen was shown to be antimetastatic, antiproliferative and cytotoxic activities.

Ascorbigen breaks down; it generates ascorbic acid as well as I3C. Ascorbigen as a source of I3C, which improves the 2/16- α -hydroxyestrone ratio. Research has shown that when combinatorial use of ascorbigen with I3C, their effect will be synergistic. They are both known as "mixed-function oxidases," which help to render carcinogens harmless before they cross the barrier to the lungs or bloodstream. Together, I3C and ascorbigen have been shown to produce up to an 80-fold increase in intestinal mixed-function oxidase activity. In addition to ascorbigen known to be an immunomodulator.

Study of chemical properties of ascorbigen showed that it is capable of different transformations in acidic (including gastric juice) and slightly alkaline (including blood)

media. The stable and unstable products of ascorbigen transformation determine the biological properties of the compound. The most important product of ascorbigen transformation in gastric juice is 5,11-dihydroindolo[3,2-b]-carbazole, with a binding affinity to the Ah receptor only 3.7×10^{-2} lower than that of tetrachlorodibenzodioxin. This compound may be responsible for modifying P450 enzyme activities. Ascorbigen and its analogues are available synthetically. Their biological evaluation showed that some of the compounds of these series are immunomodulators. The most active is N-methylascorbigen, which demonstrates therapeutic effects (inhibition of tumor growth, protection of animals from bacterial and viral infections). The immunomodulatory activity of natural ascorbigen may be an additional factor of importance for the anticarcinogenic properties.

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