

# BNHC E-Magazine

April, 2019 # 1



# Learn the knowledge, Share the knowledge, and Implement the knowledge to the benefit of humanity! BNHC

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## Message from the President, BioNatural Healing College (BNHC)



First and foremost, I am extremely thankful to Almighty God for granting me this opportunity to present the first BioNatural Healing College Magazine to our dear reader. Also, I would like to congratulate you all with the beginning of the spring season. The information provided is for educational purposes only. We hope this BNHC-E Magazine will be useful to you based with the efforts and dedication of many other researchers and colleagues around the globe. Thanking and Wishing you all have the best health and prosperous life.

Best regards,

Dr. Nadir Siddiqi Ph.D.

Dr. Nadir Sidiqi Ph.D. participated an invited speaker in the International Conference on Traditional Medicine, Phytochemistry and Medicinal Plants on October 15-17, 2018 in Tokyo, Japan. Here is the modified short version of Dr. Sidiqi presentation.  
“Detoxification: Flushing the Human Body Toxins an Approach to Health and Well-being”

Spring is a season to rid all the extra fat and toxins we have accumulated in the winter season. Similarly, the spring season is the new growth and development for cells, tissues, in humans, plants, animals and microorganisms based on laws of nature that designed and created by the Creator of creations. In the context of BioNatural cure a detoxification (the physiological process to removal of toxins from a living organism, including human body) system to experience every season especially during the fall and winter seasons when the trees fall their leaves, this means that the trees want to remove the leaves and other unwanted chemicals and going through the detoxification process.



Without a doubt human cells, tissues, organ, and whole systems, every day face many challenges and constantly are in a battle to get rid of the toxins that are consumed through food, water, and breathing in the air and also various personal care cosmetic products we use on our skin. Indeed, toxins that are present in the human body can be obtained from exogenous sources such as food, water, air, and medications; and the endogenous sources such as: the products produced by digestion, energy metabolism, tissue regeneration, and end products from the metabolism of hormones, bacterial by-products and other complex molecules<sup>1</sup>.

Therefore, the detoxification is the process that involves the mobilization, biotransformation, and elimination of toxicants of exogenous (external factors, food, water, air, cosmetic products) and endogenous (substances that originate from within an organism), origin from the body. Human cells expend large amounts of energy to ensure that detoxification pathways continue to do their work<sup>2</sup>. Water is a powerful natural remedy and acts as a solvent to dissolve substances. Cellular membranes are primarily lipid-based and impermeable to most water-soluble substances. The transport of water-soluble compounds into a cell require specialized transport proteins.



Detoxification consists of three phases (phase I, phase II, phase III) during Phase I enzymes begin the detoxification process by chemically transforming lipid soluble compounds into water soluble compounds in preparation for phase II detoxification. During the phase I numerous enzymes family are participated, but the primary family of enzymes called the cytochrome P-450s (CYPs). CYP enzymes are relatively non-specific, each has the potential to recognize and modify countless different toxin.

Phase II reactions conjugate speed up the solubility of toxins substances with different phase II types of enzymes catalyzes such as UDP-glucuronlytransferases (UGTs), Glutathione S-transferases (GSTs), sulfotransferases (SULTs), methyltransferase enzymes, arylamine N-acetyltransferases (NATs), and Amino acid conjugating enzymes.

Phase III: Involves the elimination of toxins from cells. In this phase, the products of phase I and phase II reactions are transported out of cells and into the bloodstream for elimination. Generally carried out by ATP-binding cassette (ABC) transporters. It is important to understand other several mechanisms work in concert with the phase I, II, and III for reducing or mitigating toxins exposure such as: Bile secretion, Antioxidation, heavy metal toxicity and prevention of absorption.

# How to minimize exposure to toxins/toxicants

- Drink plenty of clean water
- Avoid processed foods
- Choose Organic produce when possible
- Wash fruits and vegetables thoroughly before consuming or remove peel
- Use bisphenol A (BPA)-free or phthalate-free plastic containers, avoid warming food in plastic
- Cook foods at lower temperatures, avoid charring
- Choose cleaning products that are free of volatile compounds
- Choose wood, tiles, or other alternatives for flooring instead of carpet
- Avoid smoking and other unhealthy life style

## **Dietary Modification of Metabolic Detoxification:**

- Green Tea extracts and the quercetin
- Nrf2 activators (Nrf2 is a powerful protein within each cell in the body)
- Isothiocyanates (derived from glucosinolates sulfur containing compounds found in cruciferous vegetables e.g., broccoli)
- Sulfur constituents from garlic
- D-Limonene (from citrus oil)
- Calcium D-glucarate (present in many fruits & vegetables)
- Chlorophyllin (is a chlorophyll derivative)
- Probiotics
- N-acetyl cysteine
- Milk thistle

## Benefits of Detoxification

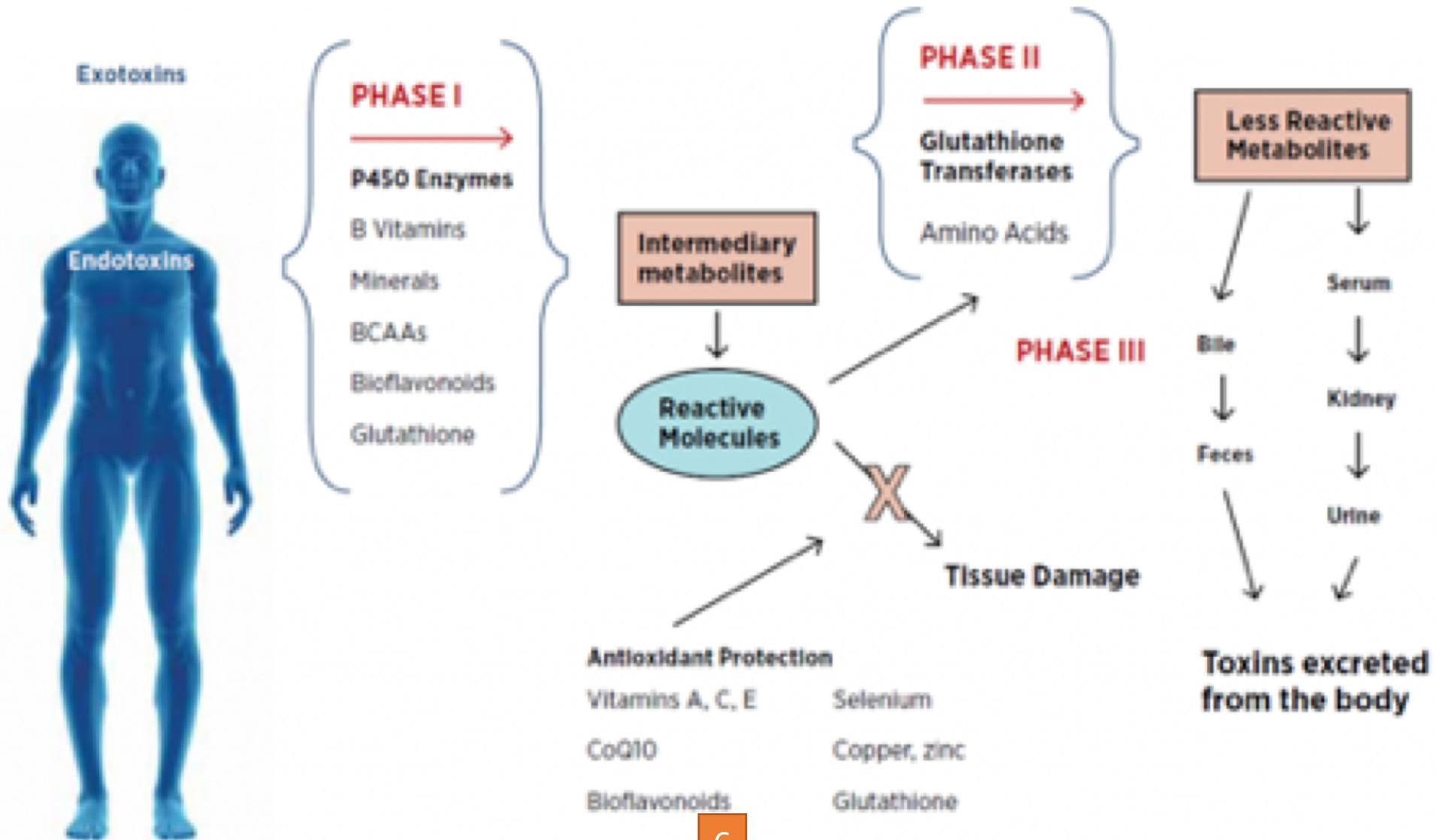
- Cleansed the digestive tract from both harmful chemicals and also bacteria that produces toxins.
- Purify the blood from the toxins, which make it easy the job for liver and kidneys through the detoxification.
- Enhance the brain function, by eliminating the toxins from the body
- Self-confidence and improve the habit to avoid sugar, alcohol, cigarette, caffeine, and processed food.
- Boost energy and immune system.

- Diet and lifestyle modification and fasting play crucial roles in approach to toxic elimination and approaching optimum health.

Indeed, human beings are a noble creature of Almighty God with complexity and delicate body composition.

Our bodies have the ability to perform detoxification to eliminate toxins, if we listen, respect, love, and implement a healthy life style to our bodies and by thanking the Creator of creations.

# THREE PHASES OF DETOXIFICATION



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3. Ames BN, Baker SM, et al. Detoxification and biotransformational imbalances. In: Alexander BJ Textbook of Functional Medicine. Federal Way, WA: Institute for Functional Medicine; 2010:275-298.
4. Baker MacDonald Sidney, "Detoxification and Healing: The Key to Optimal Health" (2002).
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Source: <https://www.scribd.com/document/214854176/Detoxification-in-the-Liver2012>

## “Black Carrot-A Rich Source of Anthocyanins”



The **carrot** (*Dacus carota* subsp. *sativus*) is a root vegetable, usually orange in colour, though purple, black, red, white and yellow cultivars exist<sup>[1]</sup>. The cultivated carrot is believed to originate from Afghanistan before the 900s, as this area is described as the primary center of greatest carrot diversity<sup>[2]</sup>, Turkey being proposed as a secondary center of origin<sup>[3]</sup>.

The first cultivated carrots exhibited purple or yellow roots. Carrot cultivation spread to Spain in the 1100s *via* the Middle East and North Africa. In Europe, genetic improvement led to a wide variety of cultivars. White and orange-coloured carrots were first described in Western Europe in the early 1600s<sup>[4]</sup>. Concomitantly, the Asiatic carrot was developed from the Afghan type and a red type appeared in China and India around the 1700s<sup>[5,6]</sup>. According to this history, it makes sense to envisage that colour should be considered as a structural factor in carrot germplasm.



**Fig. 1: Carrot Varieties and Types**

Many of the pigments in carrots serve to shield plant cells during photosynthesis. Carrots are the big sources of  $\beta$ -carotene, Vitamin-C, Polyphenols and Anthocyanin. Purple carrots possess an entirely different class of pigments from the other carrot colours-anthocyanins-which act as powerful antioxidants. Red carrots derive their colour mainly from lycopene, a type of carotene believed to guard against heart disease and some cancers. Yellow carrots accumulate xanthophylls, pigments similar to  $\beta$ -carotene that support good eye health.



Road to A Healthy Life



## Carotenoid Properties of Carrot Colours<sup>[7]</sup>:

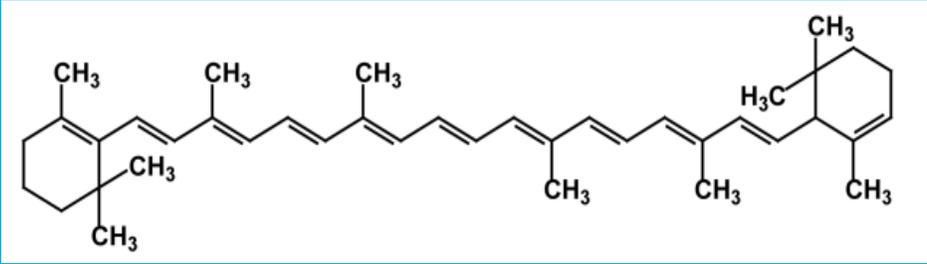
*Table 1: Concentrations of Carotenoids in Different Raw Carrot Varieties<sup>a</sup>*

### Concentrations of Carotenoids (mg/100 g Carrot)

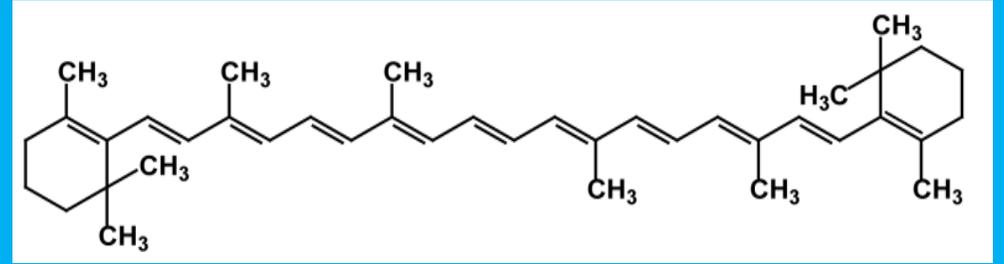
Carrot type	$\alpha$ -Carotene	$\beta$ -Carotene ( $\beta$ C)	Lycopene	Lutein	Total
High- $\beta$ C Orange	3.1 $\pm$ 2.4	18.5 $\pm$ 2.8	1.7 $\pm$ 0.83	0.44 $\pm$ 0.07	28.3 $\pm$ 0.8
Orange	2.2 $\pm$ 0.8	12.8 $\pm$ 3.3 1023x290	nd <sup>c</sup>	0.26 $\pm$ 0.08	15.2 $\pm$ 4.1
Purple	4.1 $\pm$ 1.2	12.3 $\pm$ 5.1	nd	1.1 $\pm$ 0.73	17.5 $\pm$ 7.0
Red	0.11 <sup>b</sup>	3.4 $\pm$ 0.89	6.1 $\pm$ 0.6	0.32 $\pm$ 0.26	9.8 $\pm$ 1.4
Yellow	0.05 <sup>b</sup>	0.18 $\pm$ 0.17	nd	0.51 $\pm$ 0.27	0.71 $\pm$ 0.38
White	nd	0.006 $\pm$ 0.003	nd	0.009 $\pm$ 0.002	0.014 $\pm$ 0.001

<sup>a</sup>Data are expressed as mean $\pm$ SD of three determinations on a fresh weight basis.

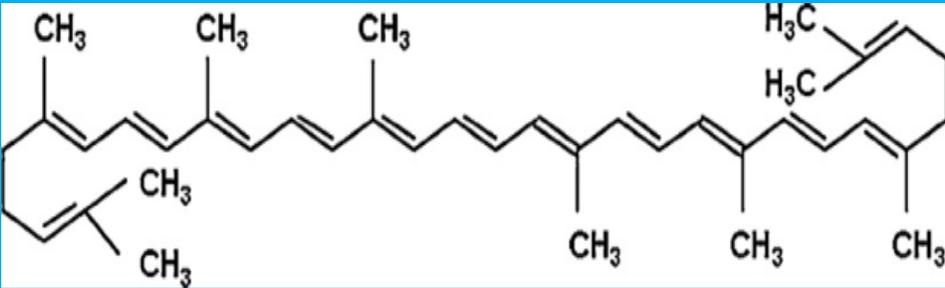
<sup>b</sup>Carotenoid values were found in only one of the tree carrots. <sup>c</sup>nd not detected.



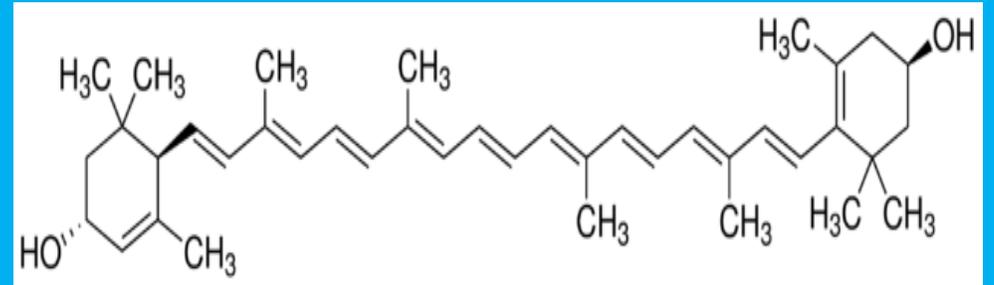
**$\alpha$ -Carotene**



**$\beta$ -Carotene**



**Lycopene**



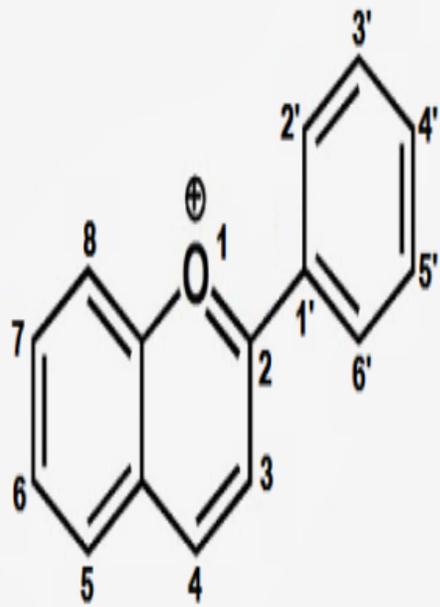
**Lutein**

**Fig. 2: Structures of Carotenoids**

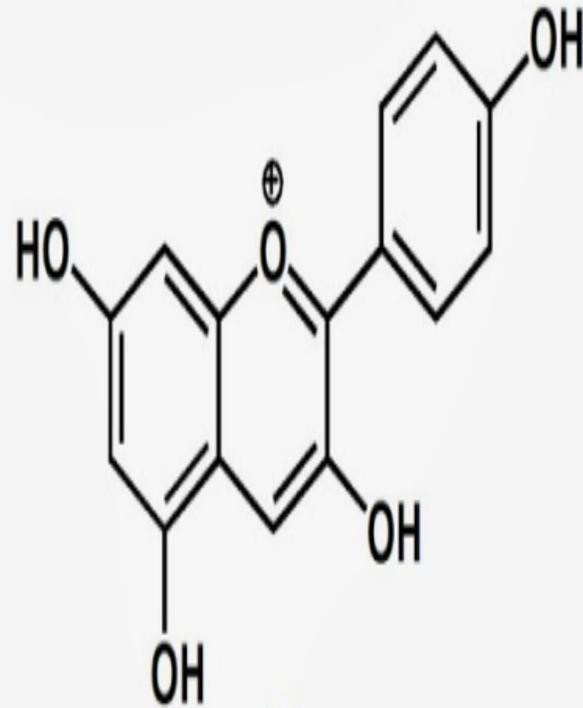
Purple (or almost black) carrots grow mostly in southern Europe and Asia. Their characteristic purple or black colour comes from pigments called anthocyanins. Anthocyanins are the water soluble natural pigments and the glycosides of anthocyanidins. These pigments exhibit a reversible change in molecular structure as the pH of solutions change from acidic to basic. This change in structure is characterized by a shift in hue from red to purple to blue as the pH changes from acidic to basic.



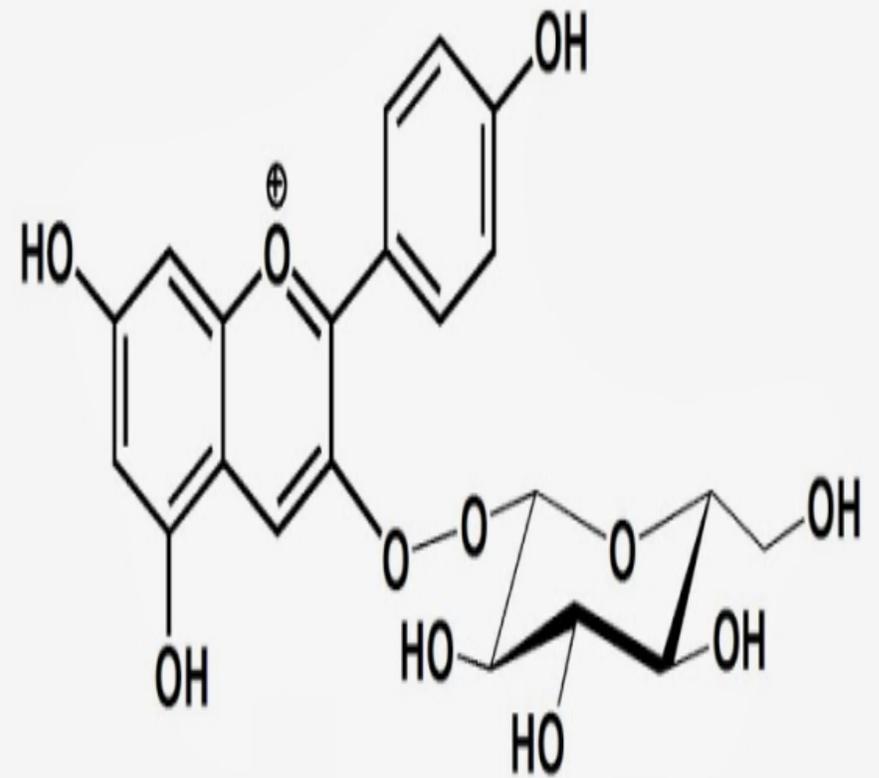
**Fig.3: Black Carrot (*Dacus carota*)**



(1)

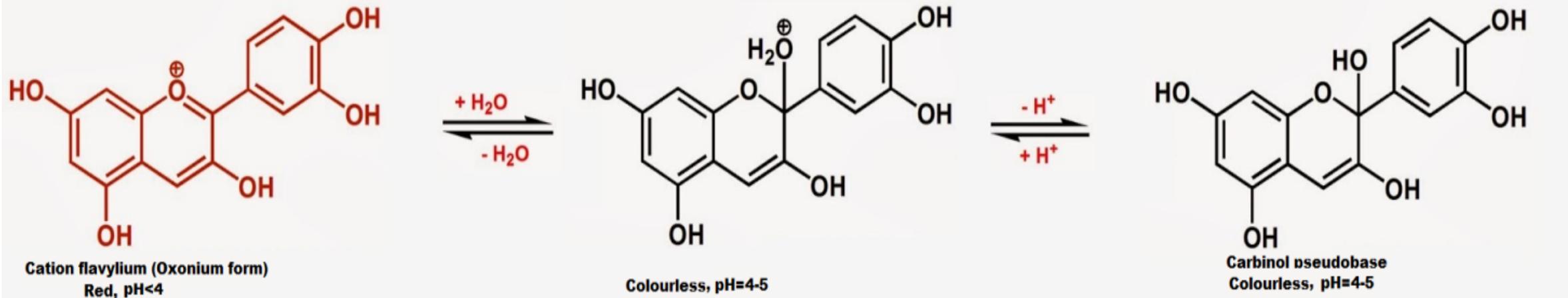


(2)

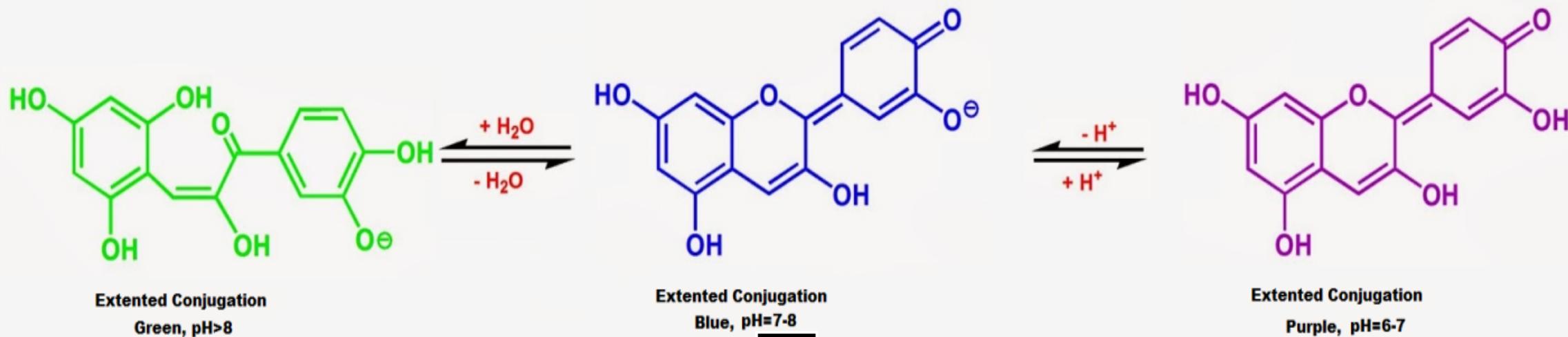


(3)

***Scheme 1: (1) Cation flavylium: General structure and numbering; (2) Anthocyanidin; (3) Anthocyanin.***



*Scheme 2: Molecular Transformations Function for pH of Anthocyanin*



## Applications:

**Anti-oxidant Activity:** The anti-oxidant activity in black carrots is strong compared to other vegetables and can provide the much needed daily intake of anti-oxidants. Anthocyanins with the ortho-dihydroxyl groups have the potential to scavenge hydroxyl radicals through the inhibition of HO• generation.

**Neurological Diseases:** Anthocyanins within the black carrot (cyanidin-O-3-glucoside and pelargonidin-O-3-glucoside), display differential neuroprotective effects against a variety of neurotoxic insults and to promote overall health.

**Cancer Cell Anti-proliferation:** The black carrot's anthocyanins also have been researched to act against multiplying cancer cells and also as a treatment for brain cancer without harming healthy cells.

**Oxidative Stress and Tissue Regeneration:** One research study found black carrot extract to reduce oxidative stress, tissue regeneration, and genotoxicity (damaged genetic information cause cells to mutate) in organs of rats.

**Heart Health:** Flavonoids like anthocyanins are linked to improving heart health and preventing heart disease mortality.

**Anti-inflammatory:** Research found that polyacetylenes in black carrot are responsible for anti-inflammatory effects.

**Promotion of Eye Health:** Carrots have long been recognized as an eye food due to their high levels of vitamin A. Anthocyanins in black carrots improve damaged proteins and improve circulation in eyes.

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Nutritional Pharmacist: Yeva Pisarevsky r.ph.



## **Irritable Bowel Syndrome**

Irritable bowel syndrome (IBS) is a common disorder that is often overlooked or undiagnosed. It affects the large intestine (colon) and commonly causes cramping, abdominal pain, bloating, gas, constipation and diarrhea. It is a chronic condition which, although rarely severe, needs to be clinically diagnosed and constantly managed. Diet and lifestyle modifications are often enough to eradicate the worst symptoms and some people may need medication and counseling.

The causes of IBS are not known, however, a number of issues can cause the syndrome. In order for the body to move food from the stomach to the rectum, the muscles in the walls of the intestines need to contract and relax as they move the matter. If, for some reason, this motion becomes sluggish it can cause constipation with hard dry stool. Or, if the motion becomes over-active, it leads to bloating, gas and diarrhea. Overreaction to stress, which may result in poorly coordinated signals between the brain and the intestines, can cause changes in the digestive process. This, in turn, can lead to pain, diarrhea or constipation, and an irritated bowel.

While the syndrome can be triggered by a variety of foods as well as stress, it can also be affected by hormones. Women are twice as likely to have IBS than men, due to hormonal changes. Many women find the symptoms are worse around their menstrual periods. Acute illnesses are sometimes a factor in the start of IBS, such as an episode of gastroenteritis, or food poisoning.

Food is absorbed through the intestine wall. 60 percent of your immune system is in the small intestine. There is a thin lining which is protecting your immune system from undigested food particles and bacteria. That lining can break down from stress, too many antibiotics and anti-inflammatories such as Advil, steroids, high-sugar, low fiber diets, and alcohol. The breakdown may trigger an active immune response, allergies and irritate the enteric nervous system – the second brain - leading to IBS. IBS tends to occur in people under the age of 45. If there is a family history of IBS, this may increase the risk. Mental health plays a big part in the risk factor also, showing a higher incidence for people with anxiety, depression, personality disorders or sexual abuse.

If you have symptoms of IBS, you should seek medical attention for an accurate diagnosis. Blood tests can determine whether symptoms like diarrhea or constipation and abdominal pain are signs of IBS. In 1990, a group of specialists from around the world developed the “Rome Criteria,” a classification system currently used for all the functional GI disorders including IBS. These are symptom-based criteria, kept up to date as new information and knowledge improves the precision of diagnosis. IBS criteria states that the condition of recurrent abdominal pain, on average, occurs at least 1 day per week over the course of 3 months, associated with a change in frequency and form of stool. During the blood test a complete blood count is done to check for anemia and other abnormalities, including tissue damage, inflammation and celiac disease.

Other tests for IBS include stool tests to check for bacterial infection, parasites or blood in stool; colonoscopy and barium enemas, as well as psychological tests.

De-stressing can help reduce the symptoms. Meditation and yoga, regular exercise, and deep breathing all help to control the effect of how we manage stress. Improve your outlook on life through positive affirmations and turning to a more positive mindset, since negativity tends to lead to depression and a sense of hopelessness. High fiber diet can greatly improve the chances of avoiding IBS and improve the recovery from the effects of IBS – a diet rich in vegetables and fruits, whole natural grains, and beans. Fiber is the part of the plant that the body cannot digest. It provides bulk in stool and serves to soften stool and control blood sugar. Biofeedback, cognitive behavioral therapy, and acupuncture can also help bring relief. Fermented foods like kefir and kimchi provide live friendly bacteria. A good probiotic will help to settle irregularities in bowel, and peppermint oil which works as an anti-spasmodic can help with the pain. Cleanse any sugar from diet and do a candida cleanse, especially if you have been taking any antibiotics over the years that led up to the IBS or wish to prevent IBS.

Taking a probiotic is very important for a person suffering from IBS. The choice of the right probiotic is essential for relieving specific symptoms of bowel inflammation. For example, if you have diarrhea, consider taking Florastor (Biocodex) or Sacro-B(Thorne). If you have pain and inflammation, try Probiotic-225 by Ortho Molecular Products or VSL-3, recommended by many doctors. Some patients feel anxious and /or depressed; Pro-Bio Mood by Pure Encapsulations is the best choice for the mental component of IBS. To supplement fiber from food sources, Metro Integrative Pharmacy has a very good selection of products, such as MediBulk by Thorne, Ayur Triphala by Douglas and Fibermend by Thorne. Don't forget to take your daily serving of anti-inflammatory fish oils, such as ProEPA, Pro-Omega 2000 capsules, of ProOmega liquid by Nordic Naturals.

## Homeopathic Remedies for IBS:

Homeopathic remedies stimulate a healthy immune response and are a well-established means of safe and effective treatment of IBS. Because symptoms can vary from person to person, the correct remedy is the one which most closely matches your unique set of physical/mental/emotional symptoms. The right remedy can alleviate symptoms remarkably fast during flare-ups and strengthen against future recurrence of IBS episodes.

The following are the best homeopathic remedies and the IBS symptoms for which they are indicated. For mild to moderate symptoms, select one and take a 30C potency remedy 1-3 times daily for up to one week. Discontinue as soon as symptoms improve. See a qualified homeopath for best results in advanced and chronic IBS.

**NUX VOMICA:** a top remedy indicated when the person has frequent or constant urging for bowel movements accompanied by abdominal pain. He can pass only a small amount of stool at a time, which temporarily alleviates the pain. There is often a distended abdomen after eating, and he is aggravated by coffee, spicy food, alcohol which he also often craves. This remedy is suited to people who tend to be ambitious, irritable, and impatient and have IBS flare-ups resulting from anger or frustration.

**ALOE:** another top remedy indicated when the primary symptom is a strong urge to pass stool soon after eating or drinking. The person often must rush to the toilet and passes a loose stool, often mixed with gas or mucus. There can also be abdominal pain before and during stool which is gone after the BM.

**ALUMINA:** Is most suited for people with IBS who are constipated. Even severe constipation can be alleviated with this remedy. Whether the stool is hard or soft, the person must strain with great effort. The intestines are very sluggish in such people who can go for days without urging for a bowel movement. Often he or she craves dry foods such as potatoes or rice, which only aggravates the condition.

**CARBO VEGETABILIS:** Indicated when distension and bloating are the primary symptom. The person feels tension and heaviness in the abdomen soon after eating, and it seems that any and all types of food turn to gas soon after a meal. Belching and or passing gas are quite common, which gives temporary relief. There are frequent loose stools with an offensive odor. He tends to crave fresh air or being fanned and may complain of stomach acidity and reflux.

**LYCOPODIUM CLAVATUM:** Indicated when the abdomen becomes distended and filled with gas after eating even a small amount of food. Cabbage, beans, and onions are especially aggravating. He prefers hot drinks and foods, and often alternates between having diarrhea and constipation. People who need this remedy usually crave sweets and have right-sided abdominal discomforts. Temperamentally suited to people who may appear confident to others but with an underlying insecurity.

**SULPHUR:** Indicated when diarrhea is much worse in the morning, often driving the person out of bed and straight to the bathroom. There may be rectal itching or burning, and burning in the abdomen as well. Such persons needing this remedy are often averse to fish and eggs and can have a Sulphur-like odor to the stool. Generally intolerant of heat and prefer cooler air and weather, and may have a history of skin complaints with itching.

**COLOCYNTHIS:** Indicated in IBS where severe cramping in the abdomen, causing the person to double over with pain or twist and writhe on the bed. This remedy can be especially helpful in acute flare-ups when cramping is the main symptom.

**ARGENTUM NITRICUM:** Indicated for diarrhea from emotional excitement or with anticipatory anxiety. Suited for extroverted and excitable people who are lively and impressionable. Especially helpful before exams or performance when nervousness leads to frequent trips to the bathroom, with gas, distension, and diarrhea. This remedy will also relieve anxiety as well as the bowel symptoms.

Other remedies for IBS: include: **Antimonium crudum, Pulsatilla, Mercurius solubilis, and Cinchona officinalis.**

**Dietary Tips for IBS: Try to eat smaller meals more frequently throughout the day**

- A good goal to work toward is having 3 meals and 2 snacks throughout the day
- Try to incorporate a well-balanced meal or snack every 2-3 hours

**Reduce consumption of fat**

- High-fat, fried and greasy foods are common triggers for gastrointestinal distress in IBS patients
- Stick to leaner meats such as chicken, turkey, fish and aim to bake, roast, or grill foods
- Opt for low-fat or nonfat alternatives to full-fat dairy products or try plant based milks such as almond, coconut, hemp or oat which are naturally lower in fat.

## Avoid gastrointestinal irritants including but not limited to, caffeine, chocolate, and alcohol

### **Reduce the amount of gas-producing foods and poorly absorbed natural sugars in your diet**

- Following a low FODMAP diet (Fermentable Oligosaccharides, Disaccharides, Monosaccharides and Polyols) helps alleviate IBS symptoms in some individuals
- According to the University of Virginia, foods that have been found to contain the highest amounts of FODMAPS and should be excluded are:
  - High fructose: Apples, pears, oranges, pineapples, melons.
  - High fructans: Onions, leeks, asparagus, artichokes.
  - Wheat-based and gluten products
  - Sugar alcohols: Including sorbitol and mannitol. These are used in many sugar-free gums, candy, and medicine. These aren't always listed on the medicine label, so you may have to ask a pharmacist.
  - High Raffinose: Legumes, lentils, cabbage, Brussels sprouts

### **Consume adequate amounts of soluble fiber.**

- Soluble fibers (not insoluble) may alleviate some of your symptoms
- Examples of soluble fiber foods include fruit, vegetables, whole grains and flaxseed
- When increasing soluble fiber in your diet, remember to drink plenty of fluids to help move the fiber through the gastrointestinal tract.

## **Supplement your diet as needed**

- When unable to find relief from symptoms through changes through your diet alone, nutritional supplements can help complement treatment
- Probiotics, digestive enzymes, fiber pills and homeopathic remedies that can dramatically reduce symptoms of IBS - ask our practitioners for help in guiding to find a product that will work for you!

### **References:**

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- <http://www.mayoclinic.org/diseases-conditions/irritable-bowel-syndrome/basics/definition/con-20024578>

## “GrapefruitSprouts”

Prof. Rosalie Stafford, Amazon Author Page [www.amazon.com/Rosalie-Stafford/e/B007GTXH1M](http://www.amazon.com/Rosalie-Stafford/e/B007GTXH1M)



***Live food.*** Organic raw food that is full of vital essence because it is not cooked, not processed at all until your own teeth and saliva start the process of digestion and, on the cellular level, you integrate the wholesome vital essence of the live food into your own body. Organic sprouts offer excellent vitality.

I discovered grapefruit sprouts a few years ago when a person who had quite a few backyard grapefruit trees invited my husband René to take as many as he wanted, as otherwise they would go to waste. Our benefactor’s venerable citrus trees yielded hundreds of organic grapefruits. For months, we gorged on Oro Blanco grapefruit. René juiced his grapefruit and I gobbled up the mounds of left-over pulp. (There was so much pulp that I shared with my many chickens and turkeys.) Because juice affects my blood sugar level, I always segmented the grapefruits and ate them out of hand, including the spongy white nutrient-rich pith lining the peel. Our store of grapefruit was so plentiful that even daily feasting hardly diminished the stash; eventually, however, the golden orbs began to show their age: the flesh became rather desiccated and not-so-delicious.

However, the seeds came into their own: nestled in the center of the citrus fruit, moistened by the fruits' own sweet essence, the grapefruit seeds were sprouting, sending tender stems and little leaves in search of sunlight. Each sprout was a shout of life-force, an exultation of vitality, a bitter-green burst of flavor. Towards the end of our grapefruit summer, I plucked out and devoured every sprouted seed I could find, donated the dried out grapefruit flesh to the poultry, and burned the oil-rich rinds, releasing a subtle hint of their bitter scent, a last hurrah.

If you are ever fortunate enough to find sprouted seeds inside an organic grapefruit, don't hesitate: *give thanks and eat!*

Next issue: "Sprigs and Twigs — Creosote and Eucalyptus"

For more info on the health benefits of eating live food, check out Dr. Edward Howell's books, *Enzyme Nutrition* and *Food Enzymes for Health & Longevity: Revised and Enlarged*. Also <https://www.freshandalive.com/about-live-food.html>

Dr. Vivek Sharma, Associate Prof. Botany (Medicinal Plants),  
& Head, Department of Botany, Eternal University-Baru Sahib, Distt. Sirmour,  
Himachal Pradesh (India). “Wheatgrass-The Panacea on Earth”



**Young** seedlings of wheat (*Triticum aestivum* L.) of family Gramineae also known as Gehun, Kanak, Godhuma, Gandham, popularly called as wheat grass/wheat seedlings are being used for extraction of crude juice for herbal medicine. The common wheat or bread wheat widely cultivated in almost all parts of the world is native to South-West Asia and the Mediterranean region. The wheat plant is believed to have multifarious pharmacological activities in addition to its numerous nutritional values.

Wheat seedlings stimulates metabolism, restores alkalinity of blood and is also a de-toxicant which helps to restore healthy cells. It is already well reported in different research papers that both fresh juice or dried powder of wheatgrass provide chlorophyll, amino acids, minerals, vitamins and enzymes and considered as powerhouse for human body. It is well reported worldwide that many low income families of the developing countries rely on simple diet of staple food crops such as wheat, maize and rice and for a healthy and rejuvenating body, green crops could be very useful in providing nutrients like vitamins, proteins, minerals and antioxidants with numerous health benefits.

In Asia and Europe, wheatgrass based products consumed in the form of juices, powders and extracts for healthy growth of human body. Wheatgrass has been identified as a complete food, providing all the nutrients than provided by any other food. It provides manifold health and wellness benefits by curing problems related with digestive system and anaemia. Wheatgrass acts as a blood purifier and strengthen the immune system. Anti-carcinogenetic activity has already been reported for wheatgrass juice.

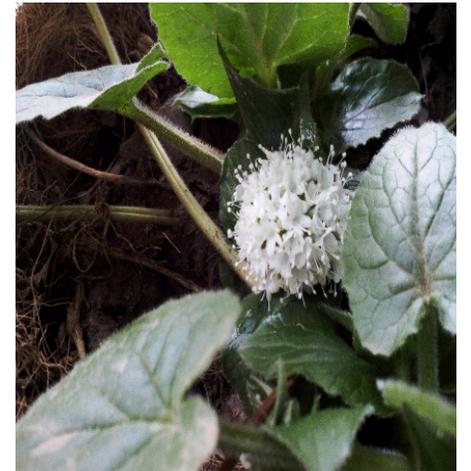
The products of wheatgrass also reported to cure many dreadful diseases such as thalassemia and distal ulcerative colitis. It was also reported that the breast cancer patients who drank wheatgrass juice daily showed a decreased need for blood and bone marrow building medications during chemotherapy, without diminishing the effects of the therapy. The therapeutic qualities of wheatgrass juice have been attributed to its nutritional content, including chlorophyll, enzymes, vitamins (A, C and E), bioflavonoids, substantial amount of micronutrients and amino acids. During germination, vitamins, minerals, and phenolic compounds including flavonoids are synthesized in wheat sprouts, with the maximum antioxidant potential.

The concentration of vitamins such as C, E,  $\beta$ -carotene, in addition to ferulic acid and vanilic acid increases with the germination period. Wheatgrass has been recommended as a supplement for the last four to five decades as a treatment for various diseases. Epidemiological studies have shown that wheatgrass products are protective against cardiovascular disease, diabetes and cancer. It has been shown that wheatgrass extracts contain significant amounts of phenolic compounds including flavonoids. Wheatgrass is hailed as 'The Panacea on Earth' by many famous naturopaths and dieticians around the world, due to the natural concentration of numerous beneficial nutrients present in it. In the last few decades, many naturopaths from various countries have studied in depth the possibility of wheatgrass for its therapeutic applications and conducted experiments to gauge its efficacy. Even to-day many people are engaged in further exploring the application of this 'wonder grass' which can be termed as 'Natures Gift to Mankind' for maintaining good health. As we know that wheatgrass juice is one of the best sources of living chlorophyll available today. However, to get the full benefit, the chlorophyll must come fresh from a living plant. Wheatgrass juice contains up to 70% chlorophyll, which is an important blood builder. The chlorophyll molecules closely resemble that of the hemin molecule, the pigment which combines with protein to form hemoglobin. Chlorophyll contains enzymes and super-oxide dismutase, a copper-containing protein found in mature red blood cells. Chlorophyll is the first product of light and, therefore, contains more light energy than any other food element. Wheatgrass juice contains crude chlorophyll (as opposed to pure) and can be taken orally and as a colon implant without side effects. In addition, scientists have never found wheatgrass to be toxic in any amount when given to either animals or humans. Science has proven that chlorophyll arrests growth and development of unfriendly bacteria. Wheatgrass juice can dissolve the scars that are formed in the lungs from breathing acid gasses. Wheatgrass is high in oxygen like all green plants that contain chlorophyll.

This is beneficial because the brain and all body tissues function at an optimal level in a highly- oxygenated environment. Wheatgrass juice is a superior detoxification agent compared to carrot juice and other fruits and vegetables. The starch of the wheat berry is stored energy which when converted to simpler sugars is a quick energy source. It contains a full spectrum of vitamins and minerals, including the thirteen essential ones, combined with dozens of trace elements and enzymes. The juice is an effective healer because it contains all minerals known to man, and vitamins A, B-complex, C, E, I and K. It is extremely rich in protein, and contains 17 amino acids, the building blocks of protein. Farmers in the Midwest who have sterile cows and bulls put them on wheatgrass to restore fertility (The high magnesium content in chlorophyll builds enzymes that restore the sex hormones). A small amount of wheatgrass juice in the human diet helps prevents tooth decay. It pulls poisons from the gums. Gargle wheatgrass juice for a sore throat. Drink wheatgrass juice for skin problems such as eczema or psoriasis. Wheatgrass juice helps to keep the hair from graying. Wheatgrass juice improves the digestion. This juice is an excellent skin cleanser and can be absorbed through the skin for nutrition. Wheatgrass implants (enemas) are great for healing and detoxifying the colon walls. Wheatgrass juice improves arthritis. For minor eye irritation apply strained wheatgrass juice mixed with half pure water in an eyecup for 15 – 30 seconds. Massage the scalp with wheatgrass juice and cover with shower cap for 15 minutes to help eliminate dandruff. Wheatgrass juice can be used as a douche for many feminine complications. Wheatgrass juice is great for constipation and keeping the bowels open because it is high in magnesium. The juice reduces high blood pressure and enhances the capillaries. It can remove heavy metals from the body. It is great for blood disorders of all kinds. And finally by taking wheatgrass juice, one may feel an increase in strength and endurance, renewed health and spirituality, and experience an overall sense of well-being. Wheatgrass has much pharmacological diversity in addition to its nutritional values which are yet to be explored. We know that, wheatgrass is not significantly popular due to little convincing research on its different indoor or outdoor growing conditions, low characteristic features corresponding to its taste, aroma, colour, poor shelf-life and its cost. Our main objective for future study is to improve the different indoor or outdoor growing conditions for wheat grass and also to optimize its taste, aroma and shelf-life of wheat grass juice powder for supreme recognition worldwide without modification in its originality.

# Anjali Thakur (Ph.D. Scholar), Evaluation of Cytomorphological, Phytochemical and Pharmacological Aspects of Genus *Valeriana* (L.)- A Threatened Understory Medicinal Herb.

Medicinal and aromatic plants played a vital role in alleviating human sufferings. Plants are utilized as therapeutic agents since time immemorial in both organized (Ayurveda, Unani) and unorganized (folk, tribal, native) form. These medicines made from the plants took in the different form of crude drugs like powder, teas, tinctures and many other herbal formulations. For the future betterment the ethnobotanical uses of medicinal plants should be explored through the older generation to the new generation. Topic of our study 'Evaluation of Cytomorphological, Phytochemical and Pharmacological Aspects of Genus *Valeriana* (L.)- A Threatened Understory Medicinal Herb' shows the objectives. For this study, we have collected the species of *Valeriana* (L.) from different regions of Himachal Pradesh. Genus *Valeriana* (L.) belongs to the family Valerianaceae and it includes about 250 species all over the world. Out of which 12 species are found in India. In Himachal Pradesh *Valeriana jatamansi* Jones is found mainly. We have collected three species of genus *Valeriana* (L.) from the different regions of Himachal Pradesh for our study. These species are *V. hardwickii*, *V. jatamansi* and *V. officinalis*. We analyse these three species on the basis of morphological, cytological, phytochemical, bioactivities, genetic diversity and herbal formulation.



*Valeriana jatamansi* Jones

On the basis of different morphometric characters, the selected plant species of genus *Valeriana* (L.) was identified. Here some key features were also identified for each species. i.e., a special type of aroma is present in *V. jatamansi* Jones which is an identification feature of this species, so that it is also known as aromatic plant. *V. hardwickii* have the 6-9 petioles are present and in *V. officinalis* there 11-21 lanceolate petioles are present. This is the first time that these three species are compared between each other. In the cytological studies, as per the previous results, *V. hardwickii* and *V. officinalis* have the same gametophytic (n) number i.e., 14 and the gametophytic number of *V. jatamansi* is 16. In our studies there is no other cytotype was found.

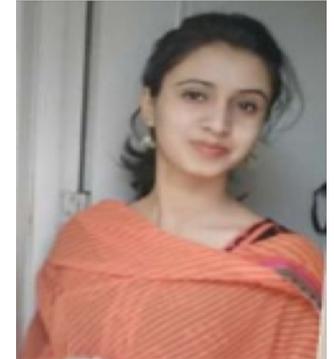
With the help of HPLC and GC-MS the phytochemical studies was done. In these analysis, we found that *V. officinalis* roots was carrying the Valerenic acid in more amount than other two selected species in HPLC analysis. In GC-MS analysis it is found that *V. jatamansi* roots was carrying 32 major components. In which isovaleric acid, methylvaleric acid and seychellene are the components found in higher amounts. This is the first time where the comparison between these three species is done on the phytochemical basis. Anti-microbial and anti-oxidant are the two bioactivities which are done to find the inhibition in these species. In the anti-microbial activities total 08 microbial strains were used which were gram-positive and gram-negative..

In these species, *V. hardwickii* showed the maximum inhibition i.e. 15mm at 100  $\mu$ L against the gram-positive bacteria *Enterococcus faecalis*, *V. jatamansi* showed the maximum inhibition against the *Bacillus subtilis* i.e., 3.5mm at 100 $\mu$ L, *V. officinalis* showed the maximum zone of inhibition against the gram- positive bacteria *Staphylococcus epidermidis* i.e., 7 mm at 100 $\mu$ L. Between these species of *Valeriana* (L.) there is no comparative data. After it, the anti-oxidant activity was done, in which, it is found that *V. hardwickii* shows the maximum inhibition among all the three species in three assays i.e., ABTS, DPPH and FRAP. After it genetic diversity was checked through the molecular characterization. RAPD markers was used for this analysis and total 97.6% polymorphism was shown in the selected species. A unique herbal formulation was made on the basis of *V. jatamansi* Jones medicinal properties. This formulation is named as ‘Natural Relaxant’ and its uniqueness is that it was made with the combination of 14 different Himalayan herbs which soothes mind, cure insomnia and act as a brain tonic. Herb selection is based on the Ayurvedic formulations and Ethnobotanical studies. Our studies suggest that *V. jatamansi* is an threatened herb and *V. hardwickii* carries the more anti-oxidant and anti-microbial inhibition. So that it can be used instead of *V. jatamansi* Jones. Future phytochemical analysis may be done on the *V. officinalis* by using GC-MS and HPLC. So, it is found that other plant species are also important as *V. jatamansi*. By the use of other species instead of *V. jatamansi* it is good for the bio-diversity. *In-vivo* propagation of *V. jatamansi* may be done in future and its germplasm would also be maintained.

## Shagun Sharma (Ph.D. Scholar): Botanical and Phyto-pharmacological Exploration of Genus *Gentiana* (L.) from Himachal Pradesh (India)-A Critically Endangered Medicinal Plant.

Through the drug plants are in high demand in traditional Ayurvedic medicinal formulations and pharmaceutical industries, no commercial cultivated is observed in any part of the country. The present research works have been done on morphology, cytology, phytochemical analysis, pharmacological activities, genetic diversity and polyherbal formulation. In cytological analysis, all present reports were similar to the previous statements. For phytochemical analysis, we have carried out HPLC analysis on the five species of genus *Gentiana* (L.) viz., (*G. argentea* Royle ex D. Don; *G. kurroo* Royle; *G. moorcroftiana* Wall. ex G. Don.; *G. pedicellata* D. Don. Grisb. and *G. pedunculata* Royle ex G. Don.).

In all these analysis the higher amount of gentiopicrin reported in *G. kurroo* Royle. Whereas, in GC-MS analysis we analyzed the 11 important components again in the species *G. kurroo* Royle, one of the component with maximum percentage of peak area was  $\alpha$ -Terpinyl acetate i.e. 36.01%. In anti-microbial activity we have studied three species such as: *G. kurroo* Royle; *G. moorcroftiana* Wall. ex G. Don.; *G. pedicellata* D. Don. Grisb. In *G. kurroo* Royle the maximum zone of inhibition was recorded in *Pseudomonas fluorescens* (Gram negative) bacteria with 4.5mm in 100 $\mu$ L of the sample.



***Gentiana kurroo*  
Royle (L.)**

In *G. moorcroftiana*, the maximum zone of inhibition was recorded in *Pseudomonas fluorescens* (Gram negative) bacteria i.e. 11mm with 100 $\mu$ L concentration of the plant sample. In comparison between these three species *G. moorcroftiana* showed maximum inhibition as compare to other two species. For anti-oxidant activity, we have studied again three species viz., *G. kurroo* Royle; *G. moorcroftiana* Wall. ex G. Don.; *G. pedicellata* D. Don. Grisb. by using three methods DPPH, ABTS, FRAP. In DPPH assay *G. kurroo* showed maximum percentage of inhibition (83.22%) at 1000 $\mu$ L concentration of the sample as compare to the other two species. In ABTS assay again *G. kurroo* showed maximum percentage of inhibition (78.89% in 1000 $\mu$ L of the sample). Whereas, in FRAP assay once again *G. kurroo* Royle indicated maximum percentage of inhibition i.e. 60.19% in 1000 $\mu$ L. The genetic diversity analysis described the polymorphism among the various accessions of the species collected from different study areas, and it is suggested that in the future more accessions should be collected and analyzed through protocols assisted by RAPD markers to discover better polymorphism, which could be due to several biotic factors and abiotic factor. On the basis of medicinal properties possessed by these plants, a unique herbal formulation named 'Natural Relaxant' was also prepared using combination of other 14 best herbs.

Available formulations in the market include only three to four herbs and their proper role was also not mentioned properly. The 'Natural Relaxant' prepared with fourteen (14) herbs provides the proper healthcare and relax the body and mind also. As per the whole study, we would like to suggest that as the *G. kurroo* Royle is an endangered species, the HPLC, GC-MS analysis and estimation of various phytochemicals and bioactivities approaches suggested that *G. kurroo* Royle and *G. moorcroftiana* Wall. ex G. Don. are equally important species. Our findings suggested that the amount of most of the major compounds in genus *Gentiana* (L.) viz., (Gentiopicrin) are also present in *G. moorcroftiana* Wall. ex G. Don. and found to be almost same as compared to *G. kurroo* Royle. These results concluded that apart from *G. kurroo* Royle other species should also be used for medicinal purposes. It will be beneficial to the environment and also to maintain the germplasm of *G. kurroo* Royle which now included under the list of threatened species.

# Pratibha Sharma (Ph.D. Scholar), Molecular Breeding and Marker Assisted Gene Pyramiding of *opaque2* with *crtRB1* and *sh2* for Improvement of Proteins and Vitamins Quality in Different Maize Lines.

Maize is a member of the grass family Poaceae. It is one of the most versatile emerging crops having wider adaptability under varied agro-climatic conditions. In India, maize is the third most important food crops after rice and wheat. Maize is an essential staple cereal crop that naturally accumulates carotenoids in the edible seed endosperm, and is thus an obvious target for biofortification of many nutrients. Maize germplasm resources exhibit wide genetic diversity with corresponding variation in carotenoid profiles, features that are useful for investigating regulatory pathways and mining breeding alleles. Maize is deficient in amino acids, lysine and tryptophan.

Deficiency in these two amino acids causes some of the fatal diseases like pellagra, kwashiorkor etc., and also malfunctions due to poor quality of proteins. Maize mutant *opaque-2* was discovered by Mertz et al., with higher lysine and tryptophan content than the normal maize kernels. However, some of the undesirable effects of *opaque-2* like soft and chalky kernels and low grain yield were rejected it in the market. In order to prevent undesirable traits of *opaque-2*, it was combined with genetic modifiers with hard kernels to give quality protein maize. The *opaque-2* is a recessive gene located on chromosome 7 and the modifiers are multigenic. Marker assisted selection in combination with conventional breeding can greatly accelerate the transfer of *opaque-2* into different cultivars of maize.



**Maize Crop**

Micronutrient malnutrition, mainly due to iron, zinc, and vitamin A deficiencies, has become one of the major health problems in under-developed and developing countries of the world. According to IFPRI (2016), 795 million people are undernourished while 2 billion people suffer from the deficiency of micronutrients. Among all the various micronutrients, the deficiency of vitamin A is responsible for many major health concerns all around the world, where approx. 20 million pregnant women are suffering from the deficiency of vitamin A and nearly 4.4 million pre-school age children suffer from vitamin A deficiency (VAD) resulting in visual impairment. However, many strategies including supplementation, dietary diversification and fortification of foods have been deployed to overcome VAD.  $\beta$ -carotene is a red-orange pigment found in plants and fruits, especially carrots and colorful vegetables. Plant carotenoids are the primary dietary source of provitamin A worldwide, with  $\beta$ -carotene as the most well-known provitamin A carotenoid.  $\beta$ -carotene is a precursor of vitamin A and gets converted into vitamin A (retinol) in human body. Vitamin A is responsible for healthy skin and mucus membranes, efficient immune system, and good eye health and vision.

Improving the micronutrient balance of staple crops such as maize through biofortification, is therefore, an economically and socially sound way to address VAD. There is considerable interest in the development of food products rich in pro-vitamin A carotenoids for potential and beneficial effects on human health over the alternative dietary supplements. More recently, enhancement of micronutrient density of plant foods through agricultural practices, especially biotechnological tools referred to as “Biofortification” is considered as a potential strategy to alleviate VAD and to improve the nutritional content of staple food crops to benefit global health. There is an established link between carotenoid intake from food and health. Biofortification involving crop varieties that are rich in micronutrients promises to be a cost-effective and sustainable approach, which provides consumers with essential micronutrients in their natural form. *Phytoene synthase 1 (PSY1 or Y1)* is the major gene which regulates the carotenoid biosynthesis, however the alleles which are dominant in nature produce yellow or orange colored pigment in the kernels and on the other hand the alleles which are recessive in nature (*y1*) forms white endosperm.

Sweet corn (*Zea mays* L. var. *rugosa* Bonaf.) eaten in the immature stage, is widely used for human consumption throughout the world. It is an important source of fiber, minerals and certain vitamins. It is produced for three distinct markets; fresh, canning and freezing. Production within these markets is largely independent of each other. Newly developed products such as sweet corn milk and soups are gaining popularity in many countries. New varieties of sweet corn have been developed with improved consistency, taste and shelf life. The adoption of newer “high sugar or sweeter” varieties with longer shelf life and new sweet corn products have increased sweet corn consumption and have helped to further expand the market. Sweet corn eating quality of fresh or processed whole kernels, canned or frozen, is determined by its unique combination of flavor, texture and aroma. Sweetness is the most important factor in consumer satisfaction with sweet corn.

Generally, maize and sweet corn are very closely related with each other. But it is sweeter than the normal maize because of the recessive mutant (*sh1*), that restrict the conversion of sugar into polysaccharides. However, this conversion still occurs, and continuous after harvest and processing, which results in quality loss during cool storage. Numerous scientists accepted that standard or sugary (*su* gene) sweet corn developed as a mutant of maize. This sweet corn accumulates about twice as much sugar (approx. 12%) and 8-10 times more water soluble saccharides than normal maize. This traditional or standard sweet corn has been available for over 170 years. Sweet corn is one of the most popular crop in U.S. and Canada. Also, in Eastern Asia and some parts of Europe, the consumption of sweet corn is rapidly increasing. Normal sweet corn with the standard sugary gene (*su1*), has a high level of phytoglycon (i.e. 121mg/g dry matter), and moderate sugar content (i.e. approx. 124mg/g dry matter). Another recessive mutant has been identified viz., ‘*shrunk2*’ (*sh2*), in which the mutation gives high sugar content (i.e. 330mg/g dry matter) but low level of peptidoglycan (i.e. 8mg/g of dry matter) which results in the extra sweetness, so this mutant also called as supersweet sweet corn. The *shrunk2* gene has also been used in conjunction with the standard sugary gene to produce cobs where 25% of the kernels have higher sugar content. Supersweet types have been in use overseas since about 1965.

As per the previous data with respect to these parameters viz., QPM,  $\beta$ -carotene and *shrunk* maize various researchers had already given their valuable views and already produced many cultivars. But our main aim is to produce composite maize open pollinated cultivars for the farmers with low maintenance cost and high-quality maize. The present work to develop the *shrunk* maize composite having *opaque2* gene and also to develop composite QPM with high  $\beta$ -carotene and essential amino acids lysine and tryptophan.

## BNHC Educational

Activity: Dr. Nadir Sidiqi Ph.D., was invited for a lecture “BioNatural Cure: The Approach to Optimum Health” on March 26 2019 at Claremont 6:30 PM and March 27 2019 at Chino Hills Community Center was organized by Pomona Valley Hospital (Los Angeles, California)

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**Accreditation and Recognition:** BioNatural Healing College is based in California. It is an institution that has the goal to deliver on-demand online distance learning around the globe. This education is of high quality and vocational in nature. BioNatural Healing College is a legal business entity that has been approved to operate by the State of California's Bureau for Private Postsecondary Education that set forth in the educational code. BioNatural Healing College is not accredited by the United States Department of Education. BioNatural Healing College is a member of the American Holistic Health Association (AHHA).

## Vision

The faculty, staff and management team of BioNatural Healing College are passionately committed to providing the best teaching possible in this field. We seek to encourage, motivate and explain the importance of this field to prospective students so that they may make an informed decision regarding enrollment. We seek an ultimate goal of satisfaction for the student based on responsibility, commitment, respect, awareness and sustainable education for society.



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