



WHEAT GRASS JUICE-NUTRITIONAL SUPPLEMENTS FOR MANAGEMENT OF VARIOUS DISEASES

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ABSTRACT

Young grass of *Triticum aestivum* is called as wheat grass that is freshly juiced or dried into powder for human consumption. Wheat grass juice contain rich source of chlorophyll, B-complex vitamins, minerals and bioflavonoids, antioxidants which play important role in management of many diseases like cancer, blood pressure, diabetes mellitus, various skin diseases, blood disorder, body rejuvenation, liver detoxification, ulcerative colitis, arthritic disorders, inflammatory disorders, tooth decay disorder and constipation. This review article is an attempt to focus on the findings of research studies of wheat grass with regard to its clinical application in various diseased conditions and its therapeutic potential for healthy body.

KEYWORDS: wheat grass, antioxidants, body rejuvenation, detoxification, ulcerative colitis.

INTRODUCTION

Wheat is used as a source of food all over the world. Wheat grass belongs to *Triticum aestivum* belong to family *Graminae*. Shoot of *Triticum aestivum* is called as wheat grass. Wheat grass contain all the nutrients which has been proved powerful health supplement. It contain chlorophyll, vitamins, minerals, antioxidants and enzymes. Wheat grass contain 98 elements and chlorophyll with higher concentration consider as blood of plant used for healing property which is freshly juiced or dried in powder and used for human consumption.^[1,2]

Wheat grass possess antibacterial, anti oxidant, anti cancer, anti ulcer property. Blood purification, liver detoxification and colon cleansing are the three important effects of wheat grass on human body. It chemically neutralizes environmental pollutants, enhances immunity, restore energy and vitality

Taxonomy of wheat plant:^[3]

Kingdom	-	Plantae
Subkingdom	-	Tracheobionta
Superdivision	-	Spermatophyta
Division	-	Magnoliophyta
Class	-	Liliopsida
Subclass	-	Commelinidae
Order	-	Cyperales
Family	-	Poaceae
Subfamily	-	Pooideae
Tribe	-	Triticeae

Genus	-	<i>Triticum</i> L.
Species	-	<i>T. aestivum</i>
Binomial name	-	<i>Triticum aestivum</i>



Image: [httpwikipedia.org](http://wikipedia.org).



Image: [httpmicrogreetfarm.com](http://microgreetfarm.com).

Composition of Wheat grass**Table 1: Nutrients presents in wheat grass juice.^[4]**

Sr. No.	Nutrients	Concentration
1	Protein	860 mg
2	B-carotene	120 IU
3	Vit.B12	0.30 mcg
4	Vit.C	1 mg
5	Vit.E	880 mcg
6	Phosphorus	21 mg
7	Magnesium	8 mg
8	Calcium	7.2 mg
9	Iron	0.66 mg
10	Potassium	42 mg
11	Chlorophyll	18.5 mg
12	Biotin	4 µg
13	Vit B5	36 µg
14	Choline	5 mg
15	Lutein	1 mg
16	Lycopene	29 µg
17	Vit B1	11 µg
18	Vit B2	260 µg
19	Vit B3	252 µg
20	Vit B6	39 µg
21	Vit K	35 µg
22	Cobalt	1.7 µg
23	Copper	17 µg
24	Iodine	8 µg
25	Maganese	240 µg
26	Phosphorus	14 mg
27	Selenium	3.5 µg
28	Sodium	1 mg
29	Sulphur	10.5 mg
30	Zinc	62 µg
31	Alanine	69 mg
32	Arginine	66 mg
33	Cystine	11 mg

- Chlorophyll-is the main constituents present in higher concentration consider as blood of plant. It neutralizes toxin in body, infection, heals the wound, overcome inflammation, and gets rid of parasitic infection, purification of blood, liver detoxification and colon cleansing.^[5,6,7]
- Proteins -Leucine, iso leucien, threonine, valine, threonine, phenylalanine, tryptophane, methionine, lysine, arginine aspartic acid, glycein, prolein, glutamic acid, alanine, tyrosine are essential and non essential amino acids present in wheat grass.
- Vitamins- Wheat grass contains carotene, Vit. A, B complex, Vit. E, C and K.
- Minerals- Important minerals like Iron, calcium, phosphorus, megnasium, zinc, copper, sodium, sulfur, boron, molybdenum, iodine are the present in wheat grass.
- Enzymes- Enzymes protease, amylase, lipase, cytochrome oxidase, trans hydrogenase, superoxide dismutase are present in wheat grass. Lipase- Lipase is a highly effective in the digestion of fats.

Enhances the digestion of proteins, starch and fat in the gastrointestinal tract. Without lipase fat stagnates and accumulates in the organs, arteries and capillaries. Cytochrome oxidase playmajor role in the body's production of energy. Cytochrome oxidase anchors a chain of enzymes in the mitochondrion; the power plant of the cell enables this by reacting with oxygen to make energy. Catalase serves to protect each individual cell from the toxic effect of hydrogen peroxide. Hydrogen peroxide is caused in the body by bacteria. Malic Dehydrogenase is another Important enzyme which helps in maintaining the body's ability to defeat bacteria and other parasitic hosts in the body.

- Absicic acid Anti-cancer agent. Protease amylaseis Important in supplementing the body's natural digestion of starches, proteins, fats and cellulose. Can help offset the worst aspects of digestive leukocytosis, the immune response to food heated over 118 degrees.
- Bioflavonoids-Apigenin, quercitin, luteonin are found in wheat grass.

Preparation of Wheat grass juice and powder: Wheat grass can be cultivated easily by growing at home mix one part peat moss with three parts planting soil and place in at least 2 inch deep plastic trays. Soak one cup of wheat for 24 hours then rinse. One cup of the seeds will be sufficient for a 25 x 35cm tray. Water the soil mixture first, then spread wheat evenly over the moist soil. Cover the wheatgrass with a paper towel and place it near a window to ensure proper ventilation for three days. However, keep away from direct sunlight. For the first three days, in the morning, water such that seeds are completely soaked in water. In the evening, lightly spray water with a spray bottle. On the fifth day, the young shoots grow above 1 inch. Now, water only once a day but ensure that the soil is damp to keep the roots moist. Around the ninth or 10th day, the wheatgrass is grows to 6 – 7 inch and is ready for harvesting. At this stage, the wheatgrass is at its nutritional peak. Cut the grass above the soil.^[8,9]

Place the fresh wheat grass, soon after cutting it, on a platform or in a pounding basic and crush it well. Then wrap them in a clean and thin piece of cloth and strain the juice out of it. A plastic strainer could also be used for this purpose. If the magnetically treated water is added to it while crushing it, the extraction of juice will be in a greater quantity with its effectiveness is also strengthened. This wheat grass can be also crushed in the electric juicer or mixer also.

Therapeutic applications of Wheatgrass in various diseases

- 1. Anticancer activity:** Wheatgrass juice contain high concentration of chlorophyll as an antioxidants, laetrile and antioxidant enzyme super oxide dismutase which converts dangerous free radical reactive oxygen species (ROS) into hydrogen

peroxides (having extra oxygen molecule to kill cancer cells) and an oxygen molecule.^[10] Wheat grass juice is used as an alternative medicine for anticancer therapy. Tetra-pyrroles contain in chlorophyll has the ability to induce mammalian phase 2 proteins that protect cells against oxidants and electrophile.^[11] Plant hormone abscisic acid (ABA) is another constituent of wheatgrass act as an anticancer agent, this hormone is 40 times more potent 4 hours after cutting the wheatgrass plant which neutralize the effect of the hormone chorionic gonadotropin and a compound similar to this hormone has been found to be produced by the cancer cells.^[12,13] Antioxidant activity of wheat grass juice in preventing oxidative damage to deoxyribonucleic acid (DNA) and lipid peroxidation, stimulation of gap junction communication, effects on cell transformation and differentiation, inhibition of cell proliferation and oncogene (cancer causing gene) expression, effects on immune function and inhibition of endogenous formation of carcinogens.^[14] Also Chlorophyll derivatives have been found to be effective in liver, colon, stomach and gastrointestinal cancer cases.^[15,16,17,18]

2. **Ulcer and wheat grass:** antiulcer activity of wheat grass is done in a randomized, double-blind, placebo-controlled study it shows effective and safe as a single or adjuvant treatment of active distal Ulcerative colitis.^[19] Most of the results of the study showed that chlorophyll was found effective in treatment of cyst wounds, fistula-in-ano, sarcoma/carcinoma, ulcerative colitis, thoracic empyema, gunshot wound sinus tracts, decubitus ulcer and burns. These clinical studies suggest that chlorophyll may be best agent known for use in the treatment of suppurative diseases, indolent ulcers or wherever stimulation of tissue repair is desired.^[20,21]
3. **Green blood Therapy:** The structure similarity between chlorophyll and hemoglobin in having a tetrapyrrole ring structure, the only difference between the two being the nature of the central metal atom - magnesium (Mg) in chlorophyll and iron (Fe) in hemoglobin. The apparent resemblance between the two is thus considered to be responsible for the therapeutic effects shown by chlorophyll in conditions involving deficiency of hemoglobin. Hemoglobin and its congeners are protein bodies which act as the oxygen carrier in higher animals by binding two electrons attached to the oxygen molecule, whereas chlorophyll is the active metabolic agent in plants which assimilates carbon from the carbon dioxide of the atmosphere by producing two electrons which are then transmitted through electron transport chain. Due to their structural similarity chlorophyll act as a blood substitute in conditions like chronic anemia, tissue hypoxia, thalassemia and other hemolytic disorders etc.

4. **B- Thalassemia:** B-thalassemia is a genetically inherited disorder that arises due to abnormal beta globin chains which are required for the synthesis of adult hemoglobin (HbA). The characteristic deficiency of beta globin chains, seen in thalassemia results in the production of abnormal red blood cells (RBCs) which leads to destruction of such RBCs in the spleen and a decreased number of RBCs in the blood. person with thalassemia may continue to produce gamma globin chains in an effort to increase the amount of fetal hemoglobin (HbF) and compensate for the deficiency of HbA. Researcher study show that use of wheat grass juice 3-5 fold increase in the production of HbF.^[22,23,24] The level and speed of induction of HbF by the wheatgrass extract is significantly greater than any of the pharmaceutical inducers available. During clinical study, the thalassemic patients were administered wheatgrass juice on a daily basis, the following conclusions were drawn - a. 50% patients showed up to 25% reduction in transfusion requirement. b. The mean time interval between transfusions increased to 29.5% c. Hemoglobin levels were not compromised by reducing transfusion volumes. d. The patients reported general well-being, improved appetite and reduced musculo-skeletal aches and pains.^[25]
5. **Haemolytic anemia:** High nutritional content that includes antioxidant vitamins (C & E) and bioflavonoids. It was seen that wheatgrass juice therapy decreased the total volume of blood transfused and increased the intervals between blood transfusions of the entire study cohort. These analyses suggested that not only is this therapy effective, but also that the benefit is related to the duration of the wheatgrass juice therapy. The beneficial effects of this therapy have been attributed to its rich nutritional content that includes antioxidant vitamins (C & E) and bioflavonoids.
6. **Detoxifying Activity:** Wheat grass containing choline having the lipotropic action is attributed to its in vivo conversion to an active compound which is retained within the hepatic cells and enhances the oxidation of fatty acids and formation of tissue lecithins. The latter effect augments lipoprotein synthesis, which acts as a transport form of fatty acids in plasma and thus helps in removal of lipids from a fatty liver.^[26] Choline promotes the removal of the esters of both cholesterol and glycerol, with the effect on the glyceride fraction preceding that on the cholesterol esters.^[26,27]
7. **Anti-arthritis activity:** Many study showed significantly decrease in symptoms of rheumatoid arthritis due to consumption of wheat grass juice.^[28,29]
8. **Anti-inflammatory activity:** Chlorophyll in wheat grass juice exhibit anti-inflammatory, wound healing and odor reducing capabilities. Chlorophyllin has bacteriostatic properties due to which it aids in wound healing and stimulates the production of hemoglobin and erythrocytes in anemic animals. wheat grass juice has been used to treat

various kinds of skin lesions, burns and ulcers due to its wound healing agent, stimulating granulation tissue and epithelization.^[30]

9. **Tooth Disorders:** For Pyorrhea and sore throat wheatgrass juice acts as excellent mouth wash. Wheat grass juice destroy toxins and bacteria from gums and teeth. Wheat is valuable in the prevention and cure of pyorrhea.^[31]
10. **Constipation:** Wheat grass is an excellent laxatives high concentration of cellulose forms bulk mass in the intestine and helps in evacuation by increasing peristalsis.
11. **Skin Diseases:** Chlorophyll act as bacteriostatic it a arrests growth and development of harmful bacteria. Wheat grass therapy can be effectively used for skin diseases and ulcerated wounds as by retarding bacterial growth, chlorophyll also act as sterilizer it applied on infected area, it alsoused in burns, scalds and various itching and burning eruptions.^[32]
12. **Digestive System Disorders:** Wheat grass juice used as an enema which helps to detoxify the walls of the colon. The general procedure is to give an enema with lukewarm or Neem water. After waiting for 20 minutes, 90 to 120 ml of wheat grass juice enema is given. It should be retained for 15 minutes. This enema is very helpful in disorders of the colon, mucous and ulcerative colitis, chronic constipation and bleeding piles.^[33]
13. **Circulatory Disorders:** Wheat grass containing chlorophyll enhances heart and lung functions. Capillary activity also increases while toxemia or blood poisoning is reduced. Due to high content of Iron in the blood and hemoglobin which improve lungs function. Chlorophyll improve oxygenation and the effect of carbon dioxide is minimized. Due to this effect wheatgrass juice is prescribed for circulatory disorders.^[34]
14. **Internal Rejuvenation:** Wheat grass juice is the rich source of protein, B complex vitamins minerals and antioxidants and as it has eight of the essential amino acids in delicately balanced proportions. When wheat protein is metabolized to health building amino acids which takes place complete internal rejuvenation. These amino acids build a resilient muscle that comes back to its original form after stretching and bending, healthy skin and hair and clearer eyesight and nourish the heart and lungs, tendons and ligaments, brain, nervous system and glandular network. Wheat grass juice contain B-complex vitamins, especially thiamine, riboflavin and niacin promote youthful energy and nourishment to the skin and blood vessels. It alsocontain minerals which helps to nourish the hormonal system, heal wounds and regulate blood pressure. Wheat juice also contain iron to enrich the bloodstream and phosphorus and potassium to maintain internal water balance along with other nutrients. Thus wheat grass juice helps to restore internal harmony.^[35,36,37]

CONCLUSION

From the studies it is concluded that wheat grass juice has been widely used to cure number of diseases like cancer due to its high content of antioxidant and chlorophyll, Hypertension, diabetes mellitus, it also to help diminish fatigue, improve sleep, increase strength and stamina, support weight loss, improve digestion and elimination, support healthy skin, teeth, eyes, muscles and joints, improve the function of our heart-lungs and reproductive organs, heal ulcers and skin sores, slow cellular aging, improve mental function, beneficial in arthritic disorders and muscle cramping, B-thalassemia, hemo-lytic anemia, asthma, allergy, inflammatory bowel disease and detoxification. High content of chlorophyll and its strucutral homology with hemoglobin indicates as a blood builder in various clinical conditions involving hemoglobin deficiency as green blood therapy. WGJ content rich source of chlorophyll, vitamins, minerals and antioxidants which aids in clinical application of WGJ in many serious clinical conditions there is lack of substantial in-vivo clinical trials in regards to its clinical application. There is scope for clinical investigation and evolution of new methods for the development of modern medicine for the treatment of other ailments. there is need for further investigation to explore therapeutic potential of WGJ for the treatment of many diseases which is safe and economical .

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