

Wheat Grass-A Wonder Herb

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ABSTRACT

Background: Oligosaccharides are composed of a variable number of monosaccharide units and very important in the biologically diverse of biological systems. **Material and Methods:** Crude water-soluble oligosaccharide was extracted from the fruiting bodies with water and then successively purified by DEAE-cellulose 52 and Sephadex G-100 column chromatography, yielding one major oligosaccharides fractions: LES-A. Structural features of *Lactarius deliciosus* (L. ex Fr.) Gray oligosaccharide (LDGO-A) were investigated by a combination of monosaccharide component analysis by TLC, infrared (IR) spectra, nuclear magnetic resonance (NMR) spectroscopy, scanning electron microscopy (SEM) and high-performance gel permeation chromatography analysis (HPGPC). **Result:** The results indicated that LDGO-A was composed of D-Glucose and D-Xylose and the average molecular sizes was approximately 945 Da. The anti-tumor activity of LDGO-A was evaluated *in vivo*. The inhibitory rate in mice treated with 40 mg/kg LDGO-A can reach 40.02%, being the highest in the three doses, which may be comparable to mannate. Histology of immune organs shows that the tissues arranged more regular and firmer, but the tumor tissue arranged looser in LDGO-A group than those in control group. Mean-

while, there is no obvious damage to other organs, such as heart. The anti-tumor activity of the LDGO-A was usually believed to be a consequence of the stimulation of the cell-mediated immune response because it can significantly promote the lymphocyte and macrophage cells in the dose range of 100-400 µg/mL *in vitro*. LDGO-A also effected the expression of some housekeeping genes mRNA in S180 tumor. **Conclusion:** Accordingly, the LDGO-A might serve as an effective healthcare food and source of natural anti-tumor compounds.

Key words: Structure elucidation, Anti-tumor assay, Water-soluble, *Lactarius deliciosus* (L. ex Fr.) Gray, Oligosaccharide.

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INTRODUCTION

Wheatgrass (*Triticum aestivum*) refers to young grass of the common wheat plant, which belongs to Poaceae family. This is the most commonly found herb in India, although its nativity is currently unknown. ¹Wheatgrass' culms are simple, hollow or pithy, glabrous, and the leaves are approximately 1.2 m tall, flat, narrow, 20-38 cm long and 1.3 cm broad. The spikes are long, slender, dorsally compressed and somewhat flattened. This plant is believed to have many nutritional values; it has been shown to have anti-inflammatory, antioxidant, anticarcinogenic, immunomodulatory, laxative, astringent, diuretic, antibacterial and anti-aging properties. Its use in acidity, colitis, kidney malfunctions, atherosclerosis and swelling has been shown to be beneficial.

NUTRITIONAL VALUE OF WHEAT GRASS

Wheatgrass packs a nutritional punch, including (per 3.5 grams) 860 mg protein, 18.5 mg chlorophyll, 15 mg calcium, 38 mg lysine, 7.5 mg vitamin C and an abundance of micronutrients, such as B complex vitamins and amino acids.

Phytochemical constituents of wheatgrass include alkaloids, carbohydrates, saponins, gum and mucilages. Its water soluble extractive value is found to be greater than its alcohol soluble extractive value.

Wheatgrass juice is crude chlorophyll and can be taken orally and as a colon implant without toxic side effects. Chlorophyll is anti-bacterial and can be used inside and outside the body as a healer. Chlorophyll (wheatgrass) rebuilds the bloodstream. Studies of various animals have shown chlorophyll to be free of any toxic reaction.² The red cell count was returned to normal within 4 to 5 days of the administration of chlorophyll, even in those animals which were known to be extremely anaemia or low in red cell count. Liquid chlorophyll gets into the tissues, refines them and makes them over. Liquid chlorophyll washes drug deposits from the body. Chlorophyll neutralizes toxins in the body.

Chlorophyll improves blood sugar problems, overcome chronic inner-ear inflammation and infection, reduce varicose veins and heal leg ulcers, eliminate impetigo and other scabby eruptions, heal rectal sores, successfully treat inflammation of the uterine cervix, get rid of parasitic vaginal infections, reduce typhoid fever, and cure advanced pyorrhea.^{1,2}

DOSE OF WHEAT GRASS

Normal person should drink one fl oz (thirty ml) fresh wheat grass juice twice a day or take three gram wheat grass powder in a glass of water, twice a day. A little honey may be added to juice to enhance taste. Else you can chew approx fifty gram fresh wheat grass. Do not take any food half an hour before and after taking wheat grass. Wheat grass powder may also be added to regular food as children sometimes may avoid taking it.³ You can mix with any other juice, except citrus juices. It is advisable to take wheat grass empty stomach in the morning.

In case of health problems quantity of wheat grass may vary according to the severity of the problem. Please do not discontinue or reduce dose of your regular medicines, if any, without consultation with your doctor.

SYSTEMIC HEALTH AND WHEAT GRASS

Wheatgrass in Cancer prevention

Wheat grass extract, which contains chlorophyll, an antioxidant, may affect cancer prevention. Additionally, selenium and lactrile present in wheatgrass have anti-cancer properties. Selenium builds a strong immune system, and can decrease the risk of cancer. Wheatgrass contains at least 13 vitamins (several of which are antioxidants) including B12, abscisic acid, superoxide dismutase (SOD), cytochrome oxidase, mucopolysaccharide.^{4,5} SOD converts two superoxide anions into a hydrogen peroxide molecule, which has an extra oxygen molecule to kill cancer cells. The true cause of the cancerous degeneration of cells has been re-

vealed to be from the destruction of a specific respiratory enzyme, cytochrome oxidase.⁴ Adjuvant fermented wheatgrass extract (Avenar nutraceutical) improves survival of high-risk skin melanoma patients. It is also observed that people undergoing chemotherapy, who are on wheatgrass, have sailed through this treatment, and have not required hospital admission, while side effects such as nausea, vomiting and mouth ulcers have been virtually non-existent.⁵

Wheatgrass and Diabetes

Supplementing its intake through wheatgrass powder has shown good improvement in resolving digestive system problems, (Diabetes) in particular. Abundance of natural fiber in wheatgrass optimizes blood sugar levels. Instrumental characterization of wheatgrass (spray dried powder of juice) confirmed the presence of chlorophyll, which is believed to be the pharmacologically active component in wheatgrass, acting as an anti-diabetic agent.¹

Wheatgrass and Rheumatoid Arthritis

Rheumatoid arthritis affects mainly younger individuals, and is three times more common in females than in males. It can persist into old age, progressively becoming more disabling. Early symptoms include redness, swelling, and soreness of joints. Often joints are affected symmetrically, that is both wrists or knees are involved.⁶ Pain and stiffness may also travel to other joints and affect the whole body. Patients with rheumatoid arthritis often claim that their symptoms are alleviated by a special diet, or by the simple elimination of certain constituents from their free choice diet. Its anti-inflammatory properties exert a positive effect on bone and joint problems, reducing pain and swelling.^{1,6}

Wheatgrass and inflammatory conditions

Wheatgrass extract (Dr Wheatgrass Skin Recovery Cream), a topical anti-inflammatory immunomodulator, substance P inhibitor, topical hemostatic agent, and stimulant of fibroblastic activity, with a wide range of healing properties, has been attracting lot of attention; it is also inexpensive.^{1,3} It was observed that wheatgrass cream reduces skin toxicity from radiotherapy. Chlorophyllin has bacteriostatic properties that aids in wound healing. It has been used to treat various kinds of skin lesions, burns, and ulcers, where it acts as a wound-healing agent, stimulating granulation tissue and epithelialization.⁷

Wheatgrass and general well being

Wheatgrass loaded with vitamins A, C, and E acts as an anti-oxidant and retards ageing of cells in the body that causes brain and heart problems. Wheatgrass is an effective tonic, beneficial for arthritis, skin allergies, graying or hair loss, weakness, kidney stones, weak eyesight, pyorrhea, or dental infections and fatigue. It is also super effective in serious cases of heart disease, acute stomach ache, infection of digestive system, gas, paralysis, asthma, constipation, diabetes, leucoderma, leukemia, and other cancers. It restores fertility and promotes youthfulness because the high magnesium content in chlorophyll builds enzymes that restore sex hormones. Wheatgrass helps to detoxify the body by breaking impacted matter in the colon.⁸ Wheatgrass juice is a fast and sure way to cleanse the body from environmental pollutants. Its high levels of enzymes and amino acids work like a natural cleanser to detoxify the liver, eliminate toxic heavy metals from the blood stream, rid the body of waste matter, and slow down the aging process. Wheatgrass and chlorophyll are phytonutrients, which are rich in amino acids, protein, fiber, vitamins, minerals, and enzymes that work mutually to strengthen immunity. It builds up resistance to diseases, eliminates body toxins, and because of its alkaline properties, it is good for urinal problems.

DENTAL DISEASES AND WHEAT GRASS

Cause of dental disease

The main causes of general dental disease are lack of minerals in the diet, low levels of some fat soluble vitamins including A, D, E, and K and in-

ability of the body to absorb such nutrients through digestion.

Many people with these deficiencies suffer from cavities and other dental problems even though they brush and floss every day. Brushing and flossing are certainly vital to good dental health but they can be far more effective if mineral and vitamin deficiencies are corrected.⁹

How Wheatgrass Can Help

Regular consumption of wheatgrass could be one of the best ways to prevent dental problems. Wheatgrass is good for your teeth for the same reasons it is good for the rest of your body. The reasons why wheatgrass is good for dental health include the following:

Wheatgrass is a highly concentrated source of vitamins A and E. Wheatgrass is a highly concentrated source of some minerals including iron, calcium, and magnesium. The enzymes in wheatgrass make it easy to digest unlike Vitamin and mineral supplements. Those who take wheatgrass will absorb more minerals and vitamins because of improved digestions.⁹

Wheatgrass is a natural antibiotic that kills many of the germs and other pathogens that cause tooth decay, periodontal disease, gum disease, cold sores, yeast infections, canker sores, and bad breath. Wheatgrass increases red blood cell production which can speed up the healing process and recovery from dental problems.

How to use wheatgrass in treating and preventing oral disease?

The best way to use wheatgrass to improve your dental health is to simply rinse your mouth out with fresh wheatgrass juice once or twice a day. Use wheatgrass juice just like you'd use a mouthwash.

Mix around one ounce of fresh or flash frozen wheatgrass with around six ounces of water. Then swish it in your mouth right away. If possible, mix fresh wheatgrass juice whenever you plan to rinse your mouth. Fresh juice is more potent.

CONCLUSION

Wheatgrass is known to help minimize fatigue, improve sleep, increase strength, naturally regulate blood pressure and blood sugar, 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, and is beneficial in arthritis and muscle cramping. It is proven to be beneficial under various conditions, such as anaemia, diabetes, cancer, eczema, constipation, kidney swelling, and common cold.¹ Thus, it should be made part of daily dietary intake in order to explore its maximum benefits.

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