Journal for Research in Applied Sciences and Biotechnology

www.jrasb.com

ISSN: 2583-4053

Volume-1 Issue-1 || April 2022 || PP. 24-39

https://doi.org/10.55544/jrasb.1.1.5

Wheat Grass (*Triticum aestivum* L.) Benefits Health in a Pandemic Scenario

Naghma Hassan[1] and Muhammad Shahin Siddique[2]

[1]Department of Biology, Shri Mata Vaishno Devi University, Jammu and Kashmir, INDIA.

[2]Department of Biology, Shri Mata Vaishno Devi University, Jammu and Kashmir, INDIA.

[1]Corresponding Author: naghma_hassan@gmail.com

www.jrasb.com || Vol. 1 No. 1 (2022): April Issue

Received: 23-03-2022	**Revised:** 13-04-2022	**Accepted:** 23-04-2022

ABSTRACT

This review study focused on wheat grass; an important Indian medicinal plant that has long been utilised in Ayurvedic medicine. For its healing properties, wheat grass juice includes every mineral possible along with vitamins A and B-Complex (combined). For its healing properties, wheat grass juice includes every mineral possible along with vitamins A and B-Complex (combined) (K). It includes 17 amino acids, the building blocks of protein, making it a high-protein food source. Superoxide dismutation enzymes help break down superoxide radicals in tissues and organs. Grass fed wheat seems to lower blood glucose levels. According to study, wheat grass juice improves general health by increasing strength, endurance, and overall happiness. Wheat grass juice consumption is widespread in both urban and rural areas. Thus, it is vital to study the therapeutic advantages of these active components present in young wheat grass on both healthy and COVID-19 affected patients to cure diseases by boosting the immune system and preventing infection and disease.

Keywords- Wheat Grass, *Triticum aestivum* L., COVID-19, medicinal plant, Ayurvedic medicine

I. INTRODUCTION

Crops of wheatgrass are produced from the cotyledons of the common wheat plant (*Triticum aestivum*), which is a member of the Gramineae family of plants. Triticum is a genus of annual and biennial grasses that produces numerous types of wheat and is planted almost everywhere on the earth. Triticum is a member of the grass family Asteraceae. Wheatgrass is a branch from the plant *Triticum aestivum*. It's also a very effective health dietary supplement, including high concentrations of vitamins, minerals, chlorophyll, and enzymes, among other nutrients and nutrients. Wheat grass is taken by humans in the form of freshly juiced or powdered wheat grass. Wheatgrass is a complete food, including 98 out of the 102 elements found in the earth. Wheatgrass contains chlorophyll, which is one of the most important nutrients since it has the ability to pull toxins from the body like a magnet. It has the power to soothe and repair tissues on the inside, which is why it is frequently referred to as plant blood. Wheat (*Triticum aestivum* L.) is a staple of human diet, particularly in developing and developing countries. In epidemiological research, it has been discovered that consuming whole grains and whole-grain products may help to prevent chronic diseases such as cardiovascular disease, diabetes, and cancer, among other things. Wheatgrass is a kind of wheat that has germinated over a period of 6-10 days and has become green. The germination of wheat sprouts results in the production of vitamins, minerals, and phenolic compounds, such as flavonoids, and the attainment of their maximal antioxidant potential. Individuals suffering with Thalassemia Major have been shown to benefit from wheat grass anti-cancerous, anti-ulcer, antioxidant, anti-arthritic, and blood-building qualities. In cancer patients, wheat grass juice has been proven to have antioxidant activity and to have a lethal effect on cancer cells when provided on a regular basis. Its high concentration of bioflavonoids, such as apigenin, quercitin, and luteoline, confers significant antioxidant activity to the plant. Iron, phosphorus, magnesium, manganese, copper, and zinc are all present in large amounts. Wheat grass has 20 distinct

ISSN: 2583-4053

Volume-1 Issue-1 || April 2022 || PP. 24-39

https://doi.org/10.55544/jrasb.1.1.5

amino acids and hundreds of enzymes that aren't seen in other diets. Wheatgrass is enriched in vitamin C, -carotene, and tocopherols, which have a high vitamin E potency. During germination, the concentrations of vanillic and ferulic acids rise. It also includes chlorophyll, which is responsible for lowering carcinogen metabolic activity. There have been reports of oxidative DNA damage having an antimutagenic impact on benzo (a) pyrene-induced mutagenicity. Wheatgrass has been shown to reduce oxidative DNA damage, according to (Falcioni et al.) A search for immunologically active oligosaccharides from wheatgrass modulate monocytes via Toll-like Receptor-2 Wheatgrass oligosaccharides may be immunostimulants, as indicated by signalling..

II. PHYSIOLOGY OF THE WHEAT GRASS

Wheat is a crop that may be adapted to a variety of environments. Climates with high rainfall, including temperate, irrigated, desert, and arid-high rainfall areas, as well as warm, humid, and dry, cold climates, are all suitable for growing it. It is unquestionably due to the complicated makeup of the plant's DNA, which provides immense flexibility to the crop, that such widespread adaptation has been possible. Wheat is classified as a C3 plant, which implies that it thrives in colder environments.

Germination to Emergence

Wheat germination requires a minimum water content of 35 to 45 percent by weight in the grain. Germination may take place at temperatures ranging from 4° to 37°C, with the ideal temperature range being 12° to 25°C. Seed size has little effect on germination, but it does have an impact on growth, development, and yield. When compared to smaller seeds, larger seeds offer various benefits, including quicker seedling development, a greater number of viable tillers per plant, and a better grain production. When a crop is cultivated under adverse conditions, such as drought, the benefit of larger seeds is apparent.

Taxonomic Classification

KINGDOM	Plantae
CLASS	Liliopsida
ORDER	Cyperales
FAMILY	Poaceae/Gramineae
GENUS	*Triticum* L.
SPECIES	*Triticum aestivum* L. – common wheat

III. CHEMICAL COMPOSITION OF WHEAT GRASS

Among the minerals found in it are calcium, phosphorus, magnesium, alkaline earth metals such as potassium, zinc, boron, and molybdenum, as well as other trace elements. One of its pharmacological effects is mediated by the action of the enzymes protease, amylase, lipase, cytochrome oxidase, transhydrogenase, and superoxide dismutase, among others (SOD). Also notable in wheatgrass is the high quantity of amino acids found in it. These include aspartic acid, glutamic acid, arginine, alpha-alanine, and serine (among others). One of the most important therapeutic benefits of wheatgrass juice is its antioxidant activity, which is derived from the high concentration of bioflavonoids found in the juice, including apigenin, quercitin, and luteolin. There are a number of additional components in this grass that have medicinal use, including the indole compounds, apigenin, and laetrile.

IV. PHARMACOLOGICAL ACTIVITIES OF PLANT

i) Chlorophyll as Green Blood:

Chlorophyll's medicinal benefits in illnesses requiring haemoglobin shortage. Chlorophyll may be used as a blood replacement in situations such as chronic anaemia, tissue hypoxia, thalassemia, and other hemolytic illnesses, among others.

ii) Blood Building Activity:

Chlorophyll from wheatgrass plants, as well as its synthetic counterpart chlorophyllin, have been linked to this clinical condition. The positive benefits might be due to the antioxidant mechanisms of the different wheatgrass components. The increased anti-oxidative ability of RBCs may help to extend the survival duration of both freshly produced cells and transfused RBCs. The following results were derived from a clinical investigation in which thalassemic patients were given wheatgrass juice on a regular basis:

a- Transfusion requirements were reduced by up to 25% in 50% of the patients.

b- The average duration between transfusions has risen by 29.5 percent.

c- Reducing transfusion volumes had no effect on haemoglobin levels.

d- Patients said they felt better overall, had a better appetite, and had less musculoskeletal aches and pains.

iii) Adjuvant Therapy in Haemolytic anaemia:

Through the use of wheatgrass juice, it was shown that the total volume of blood transfused could be reduced while the duration between blood transfusions could be increased throughout the whole study group. Not only was this therapy useful, but the advantage was discovered to be proportionate to the amount of time spent consuming wheatgrass juice, according to these research findings According to the researchers, the significant nutritional makeup of this therapy, which comprises antioxidant vitamins (C and E) and bioflavonoids, is responsible for its beneficial effects. Wheatgrass juice treatment may have impacts on cellular enzyme performance and membrane integrity owing to the influence of natural antioxidants on red blood cell

ISSN: 2583-4053

Volume-1 Issue-1 || April 2022 || PP. 24-39

https://doi.org/10.55544/jrasb.1.1.5

(RBC) antioxidant function. Studies reveal that RBCs from individuals with hemolytic diseases have lower antioxidant capabilities, as well as that antioxidant supplementation has a positive impact on RBC life duration in vivo. Wheatgrass juice's natural antioxidants are better at preventing cellular harm than they are at repairing damaged RBC enzymes and membranes.

iv) Anticancer Activity:

The high antioxidant content of wheat grass juice, which includes chlorophyll, laetrile, and the antioxidant enzyme super oxide dismutase (SOD), which converts harmful free radical reactive oxygen species (ROS) into hydrogen peroxides (which contain an extra oxygen molecule to kill cancer cells) and an oxygen molecule, makes wheat grass juice a complementary and alternative medicine (CAM) approach to cancer treatment. Another component of wheatgrass that has been related to anticancer action is abscisic acid, a plant hormone that is found in many plants (ABA). 4 hours after cutting the wheatgrass plant, this hormone is 40 times more powerful. The hormone chorionic gonadotropin may be neutralised by ABA, and cancer cells have been shown to create a molecule that is comparable to this hormone. Antioxidant activity in preventing oxidative damage to deoxyribonucleic acid (DNA) and lipid peroxidation are some of the other mechanisms proposed for wheatgrass juice's benefits. A study on animal models found that chlorophyllin inhibits the cytochrome P450 liver enzymes. This is consistent with previous in vitro research. The term includes all in vivo (whole animal) research in which the activity of the cytochrome P-450 enzyme is lowered, with the resultant lower cancer rates and longer lifespan. Wheatgrass aqueous extracts are high in antioxidants and taste well. Clinical experiments on human breast cancer have revealed that chlorophyllin, a molecule similar to synthetic chlorophyll, may reduce the incidence of breast cancer. Another in vitro research found that wheat sprout extract may reduce carcinogens' capacity to cause cancer by up to 95%.

v) Anti-Ulcer Activity:

Wheat grass (*Triticum aestivum*) juice as a single or adjuvant treatment for active distal nephrotic syndrome has been studied. The treatment of ulcerative colitis is exceedingly effective and safe (UC). Given green juice and young barley leaf green juice fractions containing water soluble proteins and chemical components, rats developed acute stress-induced stomach ulcers. Also, in another research, chlorophyll was shown to be effective in treating cyst wounds, decubitus ulcers, sarcoma/carcinoma, ulcerative colitis, thoracic empyema, and burns. Also, chlorophyll has been demonstrated to reduce odour and speed healing of limb fractures. with spectacular outcomes in certain instances, such as legs rescued from amputation. These clinical investigations imply that chlorophyll may be the most effective drug for treating suppurative illnesses, indolent ulcers, and other conditions where tissue repair stimulation is sought. It is believed to have anti-inflammatory and antioxidant properties due to the high concentration of bioflavonoids in it. It has been proven that apigenin, one of these bioflavonoids, inhibits tumour necrosis factor-induced transactivation in two studies.

vi) Antioxidant Activity:

Several degrees of protection are provided by wheatgrass extract's antioxidant activity, which includes primary and secondary radical scavenging as well as avoidance of free radical-induced membrane damage. These extracts have been shown to have significant concentrations of phenolic compounds, such as flavonoids, in their composition. It took wheat sprouts seven days to reach their peak antioxidant capacity, which was achieved after seven days of plant growth. Numerous studies have shown that wheatgrass water extracts are a potent source of anti-oxidant compounds. Wheatgrass extracts may be utilised as a dietary supplement to complement antioxidant substances such polyphenols and flavonoids, as well as their antioxidant effects.

vii) Detoxifying Activity:

The liver's vitality is important for an individual's general health since it is the primary organ involved in detoxifying. Other elements of wheat-grass juice, such as choline and its high mineral concentration, are responsible for the therapeutic value, in addition to chlorophyll's stimulating and regenerating characteristics. In research on the effects of choline on the liver, it was discovered that when experimental animals were fed a high-cholesterol diet, choline prevented fat formation in the liver. Choline enhances the clearance of cholesterol and glycerol esters, with the glyceride component of the molecule initially having the biggest impact. Lipotropic effects of choline are caused by conversion to an active molecule inside hepatic cells, which promotes fatty acid oxidation and lecithin synthesis. Choline has been shown to have a lipotropic effect in animal models of diabetes. This latter impact also increases lipoprotein production, which transports fatty acids in plasma and so helps remove lipids from a fatty liver. Indoles, including indole-3-carbinole, and ascorbigen, have been shown to boost xenobiotic metabolism in the liver and intestinal mucosa. Thus, indole molecules in wheatgrass may help deactivate carcinogens.

***viii) Anti-arthritic Activity*:**

An uncooked vegetarian diet high in lactobacilli decreased subjective symptoms of rheumatoid arthritis in a trial of rheumatoid patients. The research found that fermented wheat drinks, wheat grass drinks, dietary fibre, and iron all contributed to the reduction in disease activity index. Patients with arthritis had a high response.

ix) Anti-inflammatory Activity:

Wheat grass juice contains anti-inflammatory, wound-healing, and odor-control characteristics, and it may be either raw or cooked. Chlorophyllin possesses

ISSN: 2583-4053

Volume-1 Issue-1 || April 2022 || PP. 24-39

https://doi.org/10.55544/jrasb.1.1.5

bacteriostatic effects in anaemic animals, which help in wound healing while also stimulating the formation of haemoglobin and erythrocytes in the animals. A number of skin illnesses, burns, and ulcers have all been treated with it, and it has been shown to induce granulation tissue and epithelization while also acting as a wound healing agent.

x) Tooth Disorders:

Wheat is helpful in preventing and treating pyorrhea. Wheat takes time to chew, and since it is usually eaten with other meals, it forces other items to be chewed as well. This not only gives your teeth and gums the activity they need, but it also helps with digestion. For sore throats and pyorrhea, wheatgrass juice is a great mouthwash. It also helps to reduce tooth decay and pains. Chewing wheat grass, which removes toxins from the gums and inhibits bacterial development, is hence advantageous.

***xi) Skin Diseases*:**

Chlorophyll has been scientifically shown to stop hazardous germs from growing and developing. By regularly consuming wheatgrass juice, you may help prevent skin infections and ulcers.

xii) Digestive System Disorders:

Wheat grass juice used as an enema aid in the detoxification of the colon's walls. An enema with lukewarm or Neem water is the standard method. After waiting 20 minutes, a wheat grass juice enema of 90 to 120 mL is administered. This should be kept for at least 15 minutes. This enema is quite beneficial for colon problems, mucous and ulcerative colitis, persistent constipation, and bleeding piles.

V. CONCLUSION

Wheat grass may be the ideal choice in current pandemic situation, when global health awareness seems to be expanding and people are seeking rapid home remedies and redirecting their attention to ancient Vedic derived homemade therapeutic medicine. Nutrient density is attributable to highly active components such bioflavonoids like apigenin, quercitin, and luteolin, vitamins, and high iron, calcium, and magnesium, which not only treat different anti-inflammatory and detoxifying activities, but also give anti-arthritis and anti-ulcer benefits. It has been shown that a healthy immune system has a greater chance of fighting COVID-19. To combat this health crisis scenario, intensive research in this field is required. Wheat grass has the potential to deliver an enhanced immune booster. Wheat grass may give a healthy fuel for the body since it is simple and affordable to cultivate at home. Easy sprouting procedures and growing this green blood for a glass full of immunity might be an easy approach to acquire health and get rid of health-related issues while also offering a pre-shielded protection to battle this pandemic globally.

REFERENCES

[1] Renu Mogra and Preeti Rathi. (2013). Health benefits of wheat grass –a wonder food. *International Journal of Food and Nutritional Sciences*; 2(4), 10-13.

[2] Thompson, L. U. (1994). Antioxidants and hormone-mediated health benefits of whole grains. *Critical Reviews in Food Science and Nutrition*, *34*(5–6), 473–497. https://doi.org/10.1080/10408399409527676

[3] Jacobs, D. R., Andersen, L. F., & Blomhoff, R. (2007). Whole-grain consumption is associated with a reduced risk of noncardiovascular, noncancer death attributed to inflammatory diseases in the Iowa Women's Health Study. *The American Journal of Clinical Nutrition*, *85*(6), 1606–1614. https://doi.org/10.1093/ajcn/85.6.1606.

[4] Meyer, K. A., Kushi, L. H., Jacobs, D. R., Slavin, J., Sellers, T. A., & Folsom, A. R. (2000). Carbohydrates, dietary fiber, and incident type 2 diabetes in older women. *The American Journal of Clinical Nutrition*, *71*(4), 921–930. https://doi.org/10.1093/ajcn/71.4.921

[5] Nicodemus, K. K., Jacobs Jr, D. R., & Folsom, A. R. (2001). Whole and refined grain intake and risk of incident postmenopausal breast cancer (United States). *Cancer Causes and Control*, *12*(10), 917–925. https://doi.org/10.1023/A:1013746719385

[6] Kulkarni, S. D., Tilak, Jai. C., Acharya, R., Rajurkar, N. S., Devasagayam, T. P. A., & Reddy, A. V. R. (2006). Evaluation of the antioxidant activity of wheatgrass (*Triticum aestivum* L.) as a function of growth under different conditions. *Phytotherapy Research*, *20*(3), 218–227. https://doi.org/10.1002/ptr.1838.

[7] Singh, N., Verma, P., and Pandey, B. R. (2012), Therapeutic Potential of Organic *Triticum aestivum* Linn. (Wheat Grass) in Prevention and Treatment of Chronic Diseases: An Overview. *International Journal of Pharmaceutical Sciences and Drug Research*. 4(1), 10-14. https://ijpsdr.com/index.php/ijpsdr/article/view/166

[8] Maehle, L., Lystad, E., Eilertsen, E., Einarsdottír, E., Høstmark, A. T., & Haugen, A. (1999). Growth of human lung adenocarcinoma in nude mice is influenced by various types of dietary fat and vitamin E. *Anticancer Res.*, *19*(3A), 1649-1655. https://pubmed.ncbi.nlm.nih.gov/10470096/

[9] Bar-Sela, G., Tsalic, M., Fried, G., & Goldberg, H. (2007). Wheat Grass Juice May Improve Hematological Toxicity Related to Chemotherapy in Breast Cancer Patients: A Pilot Study. *Nutrition and Cancer*, *58*(1), 43–48. https://doi.org/10.1080/01635580701308083.

[10] Karadag, A., Ozkan, T., Altınok, B., Aydos, S., & Sunguroglu, A. (2007). Antiproliferative and apoptotic effects of wheatgrass (*Triticum aestivum* L.) extracts on chronic myeloid leukemia (CML) cell line. Planta Medica, 73(09), P_540.

[11] Aydos, Sena & Avci, Aslihan & Ozkan, Tulin & Karadag, Aynur & Gürleyik, E. & Altınok, Buket & Sunguroğlu, A.. (2011). Antiproliferative, apoptotic and antioxidant activities of wheatgrass (*Triticum aestivum*

ISSN: 2583-4053

Volume-1 Issue-1 || April 2022 || PP. 24-39

https://doi.org/10.55544/jrasb.1.1.5

L.) extract on CML (K562) cell line. *Turkish Journal of Medical Sciences. 41*(4). 657-663. 10.3906/sag-0912-425.

[12] K. Irak, H. Mert, I. H. Yoruk, I. D. Sogutlu, N. Mert. (2016). Determination of the level of some vitamin in wheatgrass and grass. *J. Harmoniz. Res. Appl. Sci. 4*(4), 145-150.

[13] Hänninen, O., Rauma, A. L., Kaartinen, K., & Nenonen, M. (1999). Vegan diet in physiological health promotion. *Acta physiologica Hungarica*, *86*(3-4), 171–180. https://pubmed.ncbi.nlm.nih.gov/10943644/

[14] Lai, C., Dabney, B. J., & Shaw, C. R. (1978). Inhibition of in vitro metabolic activation of carcinogens by wheat sprout extracts. *Nutrition and Cancer*, *1*(1), 27–30. https://doi.org/10.1080/01635587809513598

[15] Lai, C. (1979). Chlorophyll: The active factor in wheat sprout extract inhibiting the metabolic activation of carcinogens in vitro. *Nutrition and Cancer*, *1*(3), 19–21. https://doi.org/10.1080/01635587909513623

[16] Aydos, Sena & Avci, Aslihan & Ozkan, Tulin & Karadag, Aynur & Gürleyik, E. & Altınok, Buket & Sunguroğlu, A.. (2011). Antiproliferative, apoptotic and antioxidant activities of wheatgrass (*Triticum aestivum* L.) extract on CML (K562) cell line. *Turkish Journal of Medical Sciences. 41*(4). 657-663. 10.3906/sag-0912-425.

[17] Falcioni, G., Fedeli, D., Tiano, L., Calzuola, I., Mancinelli, L., Marsili, V., & Gianfranceschi, G. (2002). Antioxidant Activity of Wheat Sprouts Extract In Vitro: Inhibition of DNA Oxidative Damage. *Journal of Food Science*, *67*(8), 2918–2922. https://doi.org/10.1111/j.1365-2621.2002.tb08838.x

[18] Chang, R. (2002). Bioactive Polysaccharides from Traditional Chinese Medicine Herbs as Anticancer Adjuvants. *The Journal of Alternative and Complementary Medicine*, *8*(5), 559–565. https://doi.org/10.1089/107555302320825066

[19] Ramberg, J. E., Nelson, E. D., & Sinnott, R. A. (2010). Immunomodulatory dietary polysaccharides: A systematic review of the literature. *Nutrition Journal*, *9*(1), 54. https://doi.org/10.1186/1475-2891-9-54

[20] Tsai, C.-C., Lin, C.-R., Tsai, H.-Y., Chen, C.-J., Li, W.-T., Yu, H.-M., Ke, Y.-Y., Hsieh, W.-Y., Chang, C.-Y., Wu, C.-Y., Chen, S.-T., & Wong, C.-H. (2013). The Immunologically Active Oligosaccharides Isolated from Wheatgrass Modulate Monocytes via Toll-like Receptor-2 Signaling. *Journal of Biological Chemistry*, *288*(24), 17689–17697. https://doi.org/10.1074/jbc.M112.448381

[21] Spilde, L. A. (1989). Influence of Seed Size and Test Weight on Several Agronomic Traits of Barley and Hard Red Spring Wheat. *Journal of Production Agriculture*, *2*(2), 169–172. https://doi.org/10.2134/jpa1989.0169

[22] Mian, M. A. R., & Nafziger, E. D. (1994). Seed Size and Water Potential Effects on Germination and Seedling Growth of Winter Wheat. *Crop Science*, *34*(1), 169–171. https://doi.org/10.2135/cropsci1994.0011183X00340001 0030x

[23] M. Chauhan (2014). A pilot study on wheat grass juice for its phytochemical, nutritional and therapeutic potential on chronic diseases. *International Journal of Chemical Studies*, *2*(4), 27-34.

[24] Livingston. (1976). Abscisic acid tablets and process, *United States Patent 3958025*. https://www.freepatentsonline.com/3958025.html

[25] J Wheat, G Currie. (2007). Herbal medicine for cancer patients: An evidence based review. *The Internet Journal of Alternative Medicine*, *5*(2), 1-11. https://print.ispub.com/api/0/ispub-article/4309

[26] Tachino, N., Guo, D., Dashwood, W. M., Yamane, S., Larsen, R., & Dashwood, R. (1994). Mechanisms of the in vitro antimutagenic action of chlorophyllin against benzo[a]pyrene: Studies of enzyme inhibition, molecular complex formation and degradation of the ultimate carcinogen. *Mutation Research/Fundamental and Molecular Mechanisms of Mutagenesis*, *308*(2), 191–203. https://doi.org/10.1016/0027-5107(94)90154-6

[27] Guengerich, F. P., Kim, D. H., & Iwasaki, M. (1991). Role of human cytochrome P-450 IIE1 in the oxidation of many low molecular weight cancer suspects. *Chemical Research in Toxicology*, *4*(2), 168–179. https://doi.org/10.1021/tx00020a008

[28] Chiu, L., C. M., Kong, C., K. L., & Ooi, V., E. C. (2005). The chlorophyllin-induced cell cycle arrest and apoptosis in human breast cancer MCF-7 cells is associated with ERK deactivation and Cyclin D1 depletion. *International Journal of Molecular Medicine*, *16*(4), 735–740. https://doi.org/10.3892/ijmm.16.4.735

[29] Ben-Arye, E., Goldin, E., Wengrower, D., Stamper, A., Kohn, R., & Berry, E. (2002). Wheat Grass Juice in the Treatment of Active Distal Ulcerative Colitis: A Randomized Double-blind Placebo-controlled Trial. *Scandinavian Journal of Gastroenterology*, *37*(4), 444–449. https://doi.org/10.1080/003655202317316088

[30] Bowers, W. F. (1947). Chlorophyll in wound healing and suppurative disease. *The American Journal of Surgery*, *73*(1), 37–50. https://doi.org/10.1016/0002-9610(47)90287-0

[31] Singh, N., Verma, P., & Pandey, B. R. (2012). Therapeutic potential of organic triticum aestivum linn. (wheat grass) in prevention and treatment of chronic diseases: an overview. International Journal of Pharmaceutical Sciences and Drug Research, 4(1), 10-14. https://ijpsdr.com/index.php/ijpsdr/article/view/166

[32] Shah S. (2007). Dietary factors in the modulation of inflammatory bowel disease activity. *MedGenMed: Medscape general medicine*, *9*(1), 60.

[33] Best, C. H., & Ridout, J. H. (1933). The effects of cholesterol and choline on deposition of liver fat. *The Journal of Physiology*, *78*(4), 415–418. https://doi.org/10.1113/jphysiol.1933.sp003013

[34] Best, C. H., & Channon, H. J. (1935). The action of choline and other substances in the prevention and cure of fatty livers. *Biochemical Journal*, *29*(12), 2651–2658. https://doi.org/10.1042/bj0292651

ISSN: 2583-4053

Volume-1 Issue-1 || April 2022 || PP. 24-39

https://doi.org/10.55544/jrasb.1.1.5

[35] Bonnesen, C., Eggleston, I. M., & Hayes, J. D. (2001). Dietary indoles and isothiocyanates that are generated from cruciferous vegetables can both stimulate apoptosis and confer protection against DNA damage in human colon cell lines. *Cancer research*, *61*(16), 6120–6130.

[36] Nenonen, M. T., Helve, T. A., Rauma, A. L., & Hanninen, O. O. (1998). Uncooked, lactobacilli-rich, vegan food and rheumatoid arthritis. *Rheumatology*, *37*(3), 274–281. https://doi.org/10.1093/rheumatology/37.3.274

[37] Kumar, P., Yadava, R. K., Gollen, B., Kumar, S., Verma, R. K., & Yadav, S. (2011). Nutritional contents and medicinal properties of wheat: a review. Life Sciences and Medicine Research, 22, 1-10. https://astonjournals.com/manuscripts/Vol2011/LSMR-22_Vol2011.pdf