Significance of Godhuma (Triticum Aestivum-Wheat) Through Ayurvedic and Evidenced Based Studies : Review

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Abstract:

It is described that Godhuma is a Madhura, Sheeta, Guru, Kaphakara, Shukraprada, Balya, etc. The pharmacological screening done on Godhuma and found activities Antiproliferative, Apoptotic and Antioxidant, Hypolipidemic, Anti-ulcer, Antioxidant and Antimicrobial, Iron chelator, Cardiotonic, Immunomodulatory, Anticancer in Prevention and Treatment of Chronic Diseases. It contains Omega-3 Fatty Acids which reduces oxidative stress and improves longevity.

Introduction:

Ultimately food cultures are an important explorative field in the lifestyle of any nation's communities. The anthropologists who conducted the surveys in this field find strong correlation and significance of food in primitive rituals. It can be well stated in the book (1964) 'The Raw and The Cooked' of Lévi-Strauss found natural and cultural relationships on the culinary level2.

Immunomodulatory Activity

The study was aimed to investigate the immunomodulatory activity of Triticum aestivum water extract in Swiss albino mice and its effect on Th1/Th2 cytokine production by spleen cells. It is observed that the extract was found to increase White Blood Cells (WBC), Red Blood Cells (RBC) and Hemoglobin (Hb) concentration in both normal and myelosuppressed Swiss albino mice. Also, there was significant increase in bone marrow cellularity and hemagglutinin (antibody to SRBC) titer in animals. The extract restored Prednisolone suppressed TNF-a and IL-2 cytokines. It appears to have a significant role in immunity and findings confirm its beneficial role in hemoglobin concentration14.

Anticancer Activity:

The study was aimed to evaluation of the anticancer activity of the leaves of Triticum aestivum on Hep-2 cell line from human epithelioma of larynx. The extract showed dose dependent antitumor activity. The MTT assay showed an anti proliferative activity (IC50) at 625µg/ml of crude extract15.

Discussion:

Most of the Ayurvedic description found in the literature is based on the administration of Godhuma as a food supplement of the part used is grain only. As such no pharmacological activity carried out on the grain except few. The significant activities observed are on the leaf of the plant. The source of this knowledge may be in the traditional
practices of Indian culture. Over all, for exact effect on human being the detail study is necessary at large scale.

Introduction:

Abstract:

Indian culture has adopted wheat as one of the major supplement in food habits. Apart from regular intake of wheat as a Chapati, it is utilized in many more preparations of food items. It is estimated that more than 50 major recipes are prepared through wheat in India. This importance of wheat in Indian culture is demonstrated in many ways by various forms of rituals and traditions. Ayurveda too, described several properties of wheat as food and medicine. It is described that Godhuma is a Madhura, Sheeta, Guru, Kaphakara, Shukraprada, Balya, etc. The pharmacological screening done on Godhuma and found activities Antiproliferative, Apoptotic and Antioxidant, Hypolipidemic, Anti-ulcer, Antioxidant and Antimicrobial, Iron chelator, Cardiotonic, Immunomodulatory, Anticancer in Prevention and Treatment of Chronic Diseases. It contains Omega-3 Fatty Acids which reduces oxidative stress and improves longevity.

Key Words: Godhuma, Triticum aestivum, Pharmacological activity

Introduction:

Wheat is the most consumed grain in the world, especially in India. It is one of the major foods for Indian population. India is the second largest producer of the wheat with a record 93.90 mn tons in 2011-12 crop years (July-June) production1. The important states who contribute are Punjab, Haryana, Uttar Pradesh, Bihar, Rajasthan, Madhya Pradesh and Maharashtra. Looking for the Indian heritage, in India at every 100 Km there is a change of cultures, traditions, languages. As per this change the food habits, living habits, behavior, also changes. Depending on the tradition; the importance is given to the food items. If we study the history and traditions, wheat is prescribed in the Holy Scriptures. The scriptures specifically prescribe the use of wheat, rice, spices, dried fruits, nuts, Ghee, pulses, Dhoop, honey and other products in these sophisticated rituals. It is believed that the items cannot be replaced and without them the initiation in the form of Pooja is incomplete with no blessings. In Rajasthan, Churma Laddoos are made as a Prasad for the Pooja of Lord Shiva. There is one ceremony performed through wheat is that when the bride enters the house of her husband's family for the first time, she should kick over a metal pot containing wheat with her right foot so that the grain, spilt over the ground indicates she will bring prosperity.

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Ayurvedic Point Of View:
As a food Godhuma is a Madhura (Sweet), Sheeta (Cold), Guru (Heavy), Kaphakara, Shukraprada (Increase semen quantity), Balya (Provides strength), Snigdha (Slimy), Sandhanakara (Helpful in fractures/injuries), Jeevana (Antiaging), Briumhana (Increases bulkiness), Vrishya (Increase sexual potency), Varnya (Good for complexion), Vranyo (Wound healing), Ruchya (Tasty), Sthitvakrit (Maintain the body composition in equilibrium). It is important to note that, Godhuma as a food should be used in least 1 year old child.

Evidence Based Knowledge On Wheat
Prevention and Treatment of Chronic Diseases:

Wheat (Triticum aestivum Linn) belongs to family, Gramineae, which possesses high chlorophyll content and essential vitamins, minerals, vital enzymes, amino acids, dietary fibers. Wheat grass has been shown to possess anti-cancer activity, anti-ulcer activity, antioxidant activity, anti-arthritic activity, and blood building activity in Thalassemia Major. It helps in blood flow, digestion and general detoxification of the body. The major clinical utilities are due to its high content of bioflavonoids such as apigenin, quercitin, luteoline. Furthermore, indole compounds namely choline and laetrile present in it might be also responsible for its therapeutic potential. The presence of 70% chlorophyll, which is almost chemically identical to hemoglobin, in wheat grass makes it more useful in various clinical conditions involving hemoglobin deficiency and other chronic disorders.

Antiproliferative, apoptotic and antioxidant-

Wheatgrass extract has an antioxidant activity, inhibits proliferation of leukemia cells, and induces apoptosis; thus, this finding may represent a novel therapeutic approach for the treatment of CML. In conclusion, the wheatgrass extracts exert significant anti-proliferative and apoptotic effects against K562 cells in a concentration- and time-dependent manner against CML.

Hypolipidemic effect:

The study was conducted on the fresh Triticum aestivum grass juice (GJ) in experimentally induced hypercholesterolemia in rats. It is found that the fresh grass juice administration resulted in dose dependent significant decline in total cholesterol (TC), triglycerides (TG), low density lipoprotein-cholesterol (LDL-C) and very low density lipoprotein-cholesterol (VLDL-C) levels in hypercholesterolemic rats. Phytochemical analysis revealed the presence of flavonoids, triterpenoids, anthraquinol, alkaloids, tannins, saponins and sterols in fresh wheat grass juice. The results of present study revealed hypolipidemic effect of Triticum aestivum GJ in hypercholesterolemic rats by increasing fecal cholesterol excretion. Fresh GJ could have potentially beneficial effect in atherosclerosis associated with hyperlipidemia.

Anti-Ulcer Activity-
The juice of triticum aestivum (wheatgrass) was investigated for its antiulcer activities in animal models. It is found that the wheatgrass juice reduced the formation of ulcer induced by ethanol, significantly. The results of the study have demonstrated that Triticum aestivum juice showed strong anti-ulcer activities on the animal models investigated. The study may come up with safe and effective treatments for ulcer.

Antioxidant and Antimicrobial Activities:

The antioxidant and antimicrobial activities conducted on 3 extracts derived from wheat sprouts (Triticum aestivum L.). It is observed that the wheat sprouts' phenolic compounds had the highest antioxidant activities according to 1,1-diphenyl-2-picrylhydrazyl (DPPH) racial scavenging and super oxide dismutase (SOD)-like activity assays. The water extracted phenolic compounds of wheat sprouts showed moderate growth inhibition against Actinomycyes viscosus, Streptococcus mutans, and Streptococcus salivarius, all oral bacteria. The phenolic compounds, (ferulic acid and sinapic acid, in particular) showed the highest antioxidant and antimicrobial activities, according to DPPH racial scavenging, SOD-like activity, and paper-disc agar-diffusion assays.

One more study was carried out on the Emmer and einkorn wheat varieties which showed high AOA and can be promising sources of these nutritionally appreciated grain constituents.

Biological Evaluation of Iron Chelator

Wheatgrass is utilized for many purposes like promotion of general well-being, prevention of cancer and heavy metal detoxification. The study was planned to isolate and characterize iron chelating compound from methanol extract of wheatgrass. This isolated compound was subjected to determination of iron chelating activity in iron dextran induced acute iron overload animals. At the end of our study, we are able to characterize compound using LCMS and IR spectroscopy. Result inference is that isolated compound belonging to phenolic group and possesses in-vitro iron chelating activity.

Cardiotonic Activity

The study was carried out to determine the general cardiotonic activity by using fresh leaves juice with different dilutions compared with cardiotonic activity of digoxin. The activity was tested by using isolated frog heart assembly. The studies indicated the absence of cardiotonic activity in Triticum aestivum L. when compared with digoxin. Further studies can confirm the lack of cardiotonic activity on mammalian heart. Thus, in future it will be interesting to check this effect.
by using isolated mammalian heart11.

**Omega-3 Fatty Acids Content and Antioxidant Activity:**

The study was conducted on dried wheat leaves, to determine the antioxidant potential, the total phenolic compounds and to perform mineral analysis (Na, K, Fe, Ca, Mg, P, Zn, Cu and Mn). It was observed a predominance of polyunsaturated fatty acids (PUFA) compared to saturated fatty acids (SFA) in the lipid fraction of leaves. Leaves collected in all periods presented ratios of PUFA/SFA, omega-6 and omega-3 fatty acids (n-6/n-3) considered suitable for food. The highest content of LNA was found in leaves harvested at 60 days. Wheat leaves showed significant levels of the minerals P, Zn, Cu and Mn. These results reinforce the potential of using wheat leaves in foods, according to its antioxidant content and significant levels of LNA12.

**Oxidative Stress and Longevity**

The main objective of the study is to verify the activity of wheatgrass to counteract oxidative stress, which is one of the major causes of various diseases and ageing. The study was conducted on Drosophila melanogaster as a dietary supplement with wheatgrass extract. The study found that supplementation of wheatgrass reduces oxidative stress and improves longevity in Oregon R+ flies13.

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ACKNOWLEDGEMENT:

Author wishes to thank the Dean & Superintendent of his Institute for encouragement and appreciation.

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