

Evaluation of *In Vivo* Iron Chelating Activity of Wheat Grass (*Triticum aestivum*) In Iron-Dextran and NA-STZ Induced Iron Overload Diabetic Model

Komal Chauhan

National Institute of Food Technology Entrepreneurship and Management, India

Wheatgrass (*Triticum aestivum*), belonging to Gramineae (Poaceae) family has been used since ancient times to treat various degenerative diseases viz. cancers, cardiovascular diseases, diabetes and other morbidities like gastrointestinal disorders, anaemia, skin diseases as well as ageing. Wheat grass is a rich in antioxidants and have high phenolic and flavanoid content. The high bioactive content in wheat grass confers chelating properties thereby rendering protection at molecular level from oxidative insults owing to the increased iron levels. Iron overload has been pointed out as one of the determinants in the etiology of metabolic syndrome resulting in steatosis, insulin resistance, subclinical inflammation, resulting in metabolic alterations in carbohydrate and lipid metabolism.

The study was planned to evaluate the effect of wheat grass (*T. aestivum*, 100mg/kg) in iron dextran (12.5mg/100g body weight) and nicotinamide-streptozotocin (NA-STZ) (230mg and 5mg/kg body weight respectively) induced iron overload diabetes in wistar rats (150-200g). The rats were given single intraperitoneal (i.p.) injection of STZ and six i.p. injections of iron-dextran evenly spaced over a period of 30 days. Glibenclamide (5mg/kg body weight) and desferroxamine (40 mg/kg, p.o., per day) were used as standard drugs to treat diabetes and iron overload.

Methanolic extracts of *T. aestivum* showed the presence of flavanoids, phenolic compounds and in-vitro iron chelating activity. A considerable decrease ($p \leq 0.05$) was observed in blood glucose lipid- lipoprotein fractions, serum iron and ferritin levels in wheat grass treated groups as compared to the diabetic control and iron dextran treated control group and the levels were near to normal as in animals treated by standard drugs and control group fed on isoenergetic normal diet. The increased excretion of iron in urine and faeces illustrate the chelation of iron by wheat grass thereby resulting in reduction in iron overload induced altered glycaemic biomarkers. Furthermore, antioxidative enzymatic (SOD, CAT, GSHPx, GSH) activity increased with concomitant decrease in lipid peroxidation and TBARS levels in treatment groups indicating wheat grass besides chelating iron also have a marked effect in reducing oxidative stress. In conclusion, the study suggests that wheat grass possess beneficial effects on iron over load henceforth regulating diabetes and its associated complications.

Biography:

Dr. Komal Chauhan, Assistant Professor, in the Department of Food Science and Technology, NIFTEM, Sonipat, Haryana, India embarked her teaching career about two decades back. She has published several papers in National and International Journals. She has supervised several students at post graduate and doctorate levels. She has undertaken several research projects sponsored by UNICEF, University Grant Commission (UGC), Department of Science and Technology (DST/ SERB/MoFPI) and Department of Tribal Affairs, Govt. of Madhya Pradesh, India. She has a track record of one and a half decade of working in the area of Nutraceuticals and Functional Foods and Chronic Diseases.