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A Step to Mitigate the Effect of Malnutrition through Black Wheat

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Abstract

Micronutrients play an indispensable role for growth and development of human. In the world, several people are suffering from malnutrition and micronutrient deficiency especially due to Zinc (Zn) and Iron (Fe). To address the challenges of micronutrient deficiency, several crops as wheat, rice, maize, and leguminous crops are grown. Wheat is major cereal consumed worldwide and could be a good source to provide these micro nutritional values to the world. Black wheat can be an effective way to solve problem of malnutrition. In this article, we focused how black wheat mitigates the effect of malnutrition in human being.

Introduction

In world, many people are suffering from malnutrition. Malnutrition is occurred due to the non-availability of proper diet including primary deficient in zinc (Zn) and iron (Fe) to the living being. Nutritional quality and food quality must be improved by the bio fortification using the breeding programme and it is a sustainable solution for global malnutrition problem (Kumar *et al*., 2022). Several varieties of wheat are released as bio fortified variety over worldwide. Improvement in the nutritional value of common wheat grains (amber) in color can address the major challenge i.e. malnutrition. Normal wheat with supplemental anthocyanin (a phenolic compound) content results in colored wheat (purple, blue and black) which has been developed by National Agri-food Biotechnology Institute (NABI), Mohali, Punjab after seven years of research (Kaur*et al*., 2022). Black wheat contains 432 cal energy, 72 g carbohydrate,10 g of fat and 11 g of protein per 100 gm of serving. Black wheat chapatti is a better option for people who are allergic to wheat, suffering from digestive disorders because wheat protein gluten triggered inflammation affected soft tissue and organ of body (Ari Akin *et al*., 2022).

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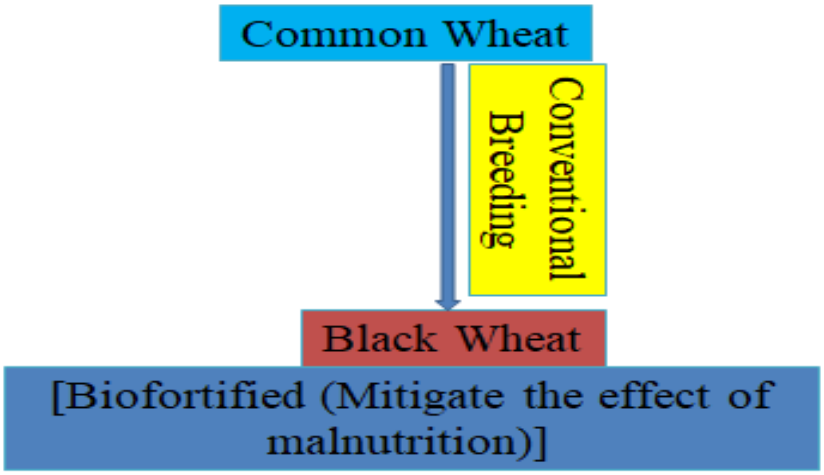
Bio-fortified black wheat has immense biological value and can become health improving food supplement. The black wheat variety has been named 'Nabi MG' which is rich in zinc and iron content compared to normal wheat, thus indicating double bio-fortified lines (Sharma *et al*., 2022) which is expected to have significant effect on human health. Black wheat is a gluten free cereal which is rich in vitamin B, protein, dietary fibre and other nutrients like phosphorus, potassium, calcium, magnesium, manganese, selenium and copper. The polysaccharide and protein content of Black wheat seeds are higher than that found in common wheat (amber color seeds) (Chaturvedi *et al*., 2022).

Development of black wheat in INDIA

Black wheat is developed through conventional breeding a technique to charge genetic pattern of plants not by the genetic engineering, to increase it utility for human so, it is not harmful to our body at all (Haroon *et al*., 2022). For development of black wheat, the crossing was done between exotic germaplsm (EC866732) procured from Japan with a normal high yielding and disease resistance wheat cultivar (PBW621) and after selection, black wheat was developed in India at NABI, Mohali under the leadership of pioneer scientist Dr. Monika Garg after seven years of long research in different seasons and regions to check its adaptability and yield potential to India's environmental conditions (Garg*et al*., 2016).



Status of black wheat in INDIA

Black wheat used by many farmers in several states such as Punjab, Uttar Pradesh, Haryana, Maharashtra, Bihar and Madhya Pradesh etc. across India (Gulati *et al*., 2022). At

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present, both black wheat and common wheat is grown in Madhya Pradesh, cultivating black wheat on more than 300 acres of land. Recent time, the seeds of black wheat is available in market. If anyone what to acquire seed of black wheat, can get from National Agri-Food Biotechnology Institute Mohali, Chandigarh (Martínez-Moreno *et al*., 2022). Due to its nutritional properties, the demand of black wheat is too high. Package and practices of black wheat is similar to that of common wheat. The plant and panicle of black wheat is green in color but when the seed starts maturing, blackish tinge starts appearing from the glume of wheat spikelet's. It requires around 130-135 days to reach maturity and seeds are smaller in size (Yadav *et al*., 2022).

Black wheat used by human under pandemic condition

Our overall health and immunity is determined by the food we consume. At this juncture, it is necessary to improve immunity by consuming nutrient rich, low carb and protein rich diets. Supplementary intake of black wheat products might help in building resilience in body and boosting immunity against infections. It would help in reducing the great risk of hyperglycemia and hypertension; strengthen the resilience in aged people or people with underlying ailment who are more subjected to severe infection (Khalid *et al*., 2022).

Conclusion

Black wheat is good source to provide the nutritional value and is much healthier as compared to normal wheat. In National Nutrition Mission or Poshan Abhiyan, black wheat is added to provide the balance nutrition to children, adolescent girl and women. It has potential to tackle under-nutrition problem and meet the target of reducing it by 2% a year in the country and benefitting farmers by fetching higher prices of their output than the production cost. So, there is need for development and utilization of several such products with better nutritional and functional properties with added health benefits.

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