DOI: 10.7860/JCDR/2026/88273.23021 Abstract No.: 29

Black Wheat: A Review on Bio-fortified Functional Food for Diabetes Mellitus

MUSKAN BANSAL[1], MADHVI AWASTHI[2]

ABSTRACT

Introduction: Diabetes is a significant contributor to global morbidity and mortality, ranking as one of the most common chronic diseases of the 21st century. The consumption of whole grains, including coarse grains, has been associated with various health benefits related to diabetes mellitus.

Aim: This review aims to examine the current literature on the role of Black Wheat (BW) in preventing and managing diabetes mellitus. The review focuses on its mechanisms of action, effects on glycaemic control, and potential dietary applications.

Materials and Methods: The review synthesised findings from various databases, including Scopus, PubMed, and Web of Science. Documents search was done by using the keywords, 'Black Wheat', 'Diabetes Mellitus', 'Wheat' and 'Coloured wheat'.

Results: The initial search resulted in 42,658 articles which were further screened and systematic reviews, editorials, meta-analysis, and review articles (narrative) and duplicates were removed. The full-text articles presenting the data on the nutritional composition and bioactive compounds present in BW, emphasising its anthocyanin content and factors beneficial for managing diabetes mellitus, were screened and retrieved. After the whole screening process, 50 articles were used in this review.

BW, a pigmented wheat variety developed by crossing purple and blue wheat varieties, contains higher anthocyanin levels (40-140 ppm) compared to white wheat (5-15 ppm). Its anthocyanins, along with phenolic acids, tocopherols, carotenoids, and other bioactive compounds, contribute to its anti-diabetic properties. BW is also rich in dietary fibre, essential amino acids, vitamins, and minerals (zinc, iron, calcium, selenium). Clinical trials have demonstrated that the black wheat (BW) diet effectively inhibits Interleukin-6 (IL-6) and Tumour Necrosis Factor-alpha (TNF-α) levels associated with diabetes. Furthermore, studies indicate that BW consumption significantly lowers blood glucose and Glycosylated Haemoglobin (HbA1c) levels while enhancing insulin sensitivity, oral glucose tolerance, and insulin tolerance, highlighting its potential as a functional food for the management of diabetes and its associated complications.

Conclusion: BW shows potential as a dietary intervention for managing diabetes due to enhanced nutritional profile, low glycaemic index and better α-amylase and α-glucosidase enzyme inhibitory activity.

Keywords: Anthocyanin, Coloured wheat, Nutrition

PARTICULARS OF CONTRIBUTORS:

1. PhD scholar, Department of Nutrition and Dietetics, School of Allied Health Sciences, Manav Rachna International Institute of Research and Studies (Deemed to be University), Faridabad, Haryana, India.
2. Associate Professor, Department of Nutrition and Dietetics, School of Allied Health Sciences, Manav Rachna International Institute of Research and Studies (Deemed to be University), Faridabad, Haryana, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Muskan Bansal,
PhD scholar, Department of Nutrition and Dietetics, School of Allied Health Sciences, Manav Rachna International Institute of Research and Studies (Deemed to be University), Faridabad-121004, Haryana, India.
Email: muskanbansal540@gmail.com