Lactobacillus Coryniformis BCH-4 as Bioprotectant of *Zea Mays* L By Improving Its Nutritional Contents

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ABSTRACT

Introduction: Fungal contamination causes discoloration, deterioration, and loss of nutritional contents in cereal grains. Lacticacid bacteria (LAB) have diversified functions to prevent the growth of pathogenic microorganisms by restoring the nutritional contents of grains.

Objectives: The current study evaluated the potential of *Lactobacillus coryniformis* BCH-4 against *Aspergillus flavus*. The antifungal effect of *L. coryniformis* BCH-4 was also evaluated as bioprotectant of Zea mays L. treated with *A. flavus* by improving its nutritional contents.

Methodology: Cell free supernatant (CFS) of *L. coryniformis* BCH-4 was obtained from 72h culture of *L. coryniformis* BCH-4. The CFS was checked for growth inhibition of *A. flavus* on maize grains under different treatments. Additionally, the nutritional contents, total phenolic, flavonoid contents, antioxidant activity and detection of aflatoxins of these treatments were also determined. HPLC analysis of CFS was also performed for determination of phenolic acids in CFS.

Results / Conclusion: The results depicted that no fungal growth was observed even after seven days of incubation with *A. flavus*. FTIR spectrum of T1: raw (untreated) and T2: MRS+ *A. flavus*, T3: CFS + *A. flavus* (treated maize grains) showed the difference in peak of functional groups of proteins, lipids, and carbohydrates. Total phenolic, flavonoid contents, and antioxidants potential of T3 were improved as compared to T1 and T2 maize grains. Moreover, in T3 treatment aflatoxins were not detected however, in T2 the aflatoxins B1 and B2 were observed. In addition, HPLC analysis of CFS showed the presence of caffeic acid, sinapic acid, salicylic acid, p- coumaric acid, 4-hydroxybenzoic acid, and chlorogenic acid and due to these acids the antioxidant potential and contents were higher in T3 grains. Conclusively, these results showed that *L. coryniformis* BCH-4 CFS could be a good bioprotectant for *Zea mays* L. by improving its phenolic contents.

Keywords: *Lactobacillus coryniformis* BCH-4, *Zea mays* L, Bioprotectant, FTIR, HPLC.

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