

عنوان مقاله:

Extraction and Molecular Evaluation of Phytase-Producing Bacteria from Soil of Alfalfa and Clover Fields of Isfahan

محل انتشار:

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خلاصه مقاله:

The main storage form of phosphorus is phytate (Myo-inositol Hexakisphosphate) in legume crops, such as clover and alfalfa, which are of high importance in terms of nutrition for humans and animals. In animals, due to a lack of phytase enzymes in their intestines, it is not possible to break the phytic acid (a nutritional constituent). Hence, phytic acid acts as an anti-nutritional chelating agent for various metal ions like Ca, Mg, Fe, Zn, etc., so it reduces the nutritive quality of food. Since phytase is an important enzyme in the food/feed industry, the objective of this study is to isolate phytase-producing bacteria cells to analyze phytate molecules. The present study was conducted in the laboratory of the Sana Institute of Higher Education. In this study, 8 soil samples of alfalfa and clover fields located in Isfahan (Khomeini Shahr and Morche Khort Regions) were collected and several bacteria isolates were separated using differential media. To examine the phytase activity, the isolated bacteria on the specific media fortified with phytate were cultivated and positive phytate bacteria were identified using morphological traits, biochemical tests, and 16srRNA sequencing determination. The data obtained from quantitative properties showed that two isolates of B1 and D1 have 17 and 20 mm size of zone diameters, respectively. Based on morphological properties, the B1 bacteria showed a big size of the colony, with a bump hanging in the margin surrounding the colony and white pigment, which was gram-positive. However, the D1 sample indicated a small colony size, with a wavy margin, smooth bump, and creamy pigment which was gram-positive. By biochemical recognition test, among all bacteria cells, two bacteria colonies were distinguished concerning the phytase activity and were recognized as *Bacillus* sp. In addition, the 16srRNA sequencing analysis showed that one strain belongs to *Bacillus paralicheniformis* (95%) and the other one is related to *Bacillus endophyticus* (95%), both of which are found in soil usually.

کلمات کلیدی:

16srRNA, *Bacillus*, Gene, Phytase, Phytic acid

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