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Fungal Phytases: Production and Biotechnological Applications

The major form of organic phosphorus in seeds is a class of anti-nutritional factor called phytic acid, whose ill-effects can be eliminated by the activity of phosphatases. Monogastric animals suffer from mineral deficiency and phosphorus pollution due to phytic acid excretion as they lack the enzyme to utilize phytate-phosphorus. Among the fungal phytases, those from Aspergillus species have gained popularity due to magnificent attributes such as wide substrate selectivity spectrum along with thermostability and protease resistance. The production of fungal phytases by fermentation with different agro-industrial byproducts has shown to be a low cost approach. The synthesis of phytases is influenced by physical and chemical factors such pH, temperature, initial media component concentrations, etc. Efforts to enhance the production of phytase by mixed substrate fermentation have been made. There is a sharp increase in phytase production after the optimization of culture conditions. Fungal phytases are capable of dephytinizing feed and food, by releasing soluble proteins, carbohydrates and minerals to improve the nutritional quality. In addition to aiding in the transfer of phosphorus and other nutrients needed for plant growth, fungal phytase are applied to bread-making industry, myo-inositol phosphates production, biofuel fabrication, semi-synthesis of peroxidase as well as environmental pollution control. The principal discussion in this review will be on the synthesis of fungal phytases and their applications in different biotechnological sectors.
Keywords: Phytic acid, phytases, fungi, fermentation conditions, agro-wastes .

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