LIQUID-LIQUID EXTRACTION OF A PHYTASE FROM SCHIZOPHYLLUM COMMUNE USING AQUEOUS TWO-PHASE


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Phytases are enzymes that catalyze the hydrolysis of phytic acid and its salts (phytates) to inositol phosphates, myo-inositol and inorganic phosphate. Phytates are found mainly in some seed grains, cereals. This antinutrient chelates ions, some proteins and starches and forms complexes, reducing their bioavailability. Phytases increase the absorption of phosphorus during digestion in pigs, poultry, fishes and human. These enzymes have an interesting feed and food application. In this study, an alternative recovery strategy of aqueous two-phase system (ATPS) with polyethylene glycol (PEG) and sodium citrate system was utilized for phytase extraction. The enzyme was produced by S. commune through solid-state fermentation using wheat bran as substrate. A $2^4$ experimental design (20 runs and 4 central points) were carried out testing four factors (citrate concentration, PEG molar mass, PEG concentration and pH) affecting the enzyme extraction from crude extract. The responses analyzed were partition coefficient ($K$), yield ($Y$) and the purification factor ($PF$). Citrate concentration had the greatest positive effect, provided the highest value of partition coefficient ($K$) equivalent to 2.63. The higher phytase yield was 367% with the system citrate concentration 14% (w/w), 22% (w/w) PEG molar mass 1500 (g/mol), and pH 7. The best purification factor in the top phase (PEG) was 5.43. The liquid-liquid extraction may be used as an alternative for purification steps strategy.

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