

Production of Phytate-Degrading enzyme from Malaysian soil bacteria using rice bran containing media.

ABSTRACT

The aims of the study were to observe the effects of different concentration of rice bran in different media on phytase synthesis and to optimize the temperature and pH of the media for phytase production by those bacterial strains. Three bacterial strain isolates obtained from the soil of Malaysian maize plantation were used to produce phytase. In this study, the effects of different rice bran concentration, incubation temperature and initial pH-values of the media on phytase production were evaluated. Incorporation of 7.5% rice bran has the inducible effect on all the bacterial tested. In respect to phytase production, the best cultivation media and cultivation time for *Bacillus cereus* ASUIA260 was PFE with 7.5% rice bran after 3 days, whilst for *Pantoea stewartii* ASUIA271 and *Enterobacter sakazakii* ASUIA279, it was LB with 7.5% rice bran after 3 days and 5 days, respectively. The arrangement of those isolates according to their ability to produce phytases were *E. sakazakii* ASUIA279 > *P. stewartii* ASUIA271 > *B. cereus* ASUIA260. Production of phytase by those bacteria was triggered by the high content of organic phytate in the rice bran. Optimum temperature for phytase production of *B. cereus* ASUIA260 was 41 °C compared to *P. stewartii* ASUIA271 and *E. sakazakii* ASUIA279 with 33 °C and 37 °C, respectively. Optimum initial pH for phytase production of *B. cereus* ASUIA 260 was pH 7.2, while *P. stewartii* ASUIA271 and *E. sakazakii* ASUIA 279 were both at pH 6.0.

Keyword: Bacterial phytase; *Bacillus cereus*; *Enterobacter sakazakii*; *Pantoea stewartii*; Rice bran.