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Hyper production of Acid protease by food grade fungi using food by-product

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Screening of food grade and industrial *Aspergillus oryzae* strains was performed and the potential strain *A. oryzae* RIB 40 (ATCC 42149) yielding 20.5 U/ml of acid protease on enrichment media was identified. However, productivity of the parent strain was improved by UV mutagenesis with a lethality of 1.8×10^{-4}. The mutant strain (F6) produced 115 U/ml, which is 5.6 times higher than the parent. Solid state fermentation of potato pulp powder and optimization of biovariables, namely moisture (50 %), temperature (30 ℃) and fermentation time (120 h) for efficient protease production, accomplished using a central composite rotatable experimental design, led to an 11-fold increase in protease activity (31 U/g dry substrate). The protease from *A. oryzae* also released glycine (0.57 ± 0.25 U/g) and 40.65 nkat/g carboxy peptidases activity which can enhance food palatability. Further basic studies considering that *A. oryzae* is able to respond to light and as conserved light related genes in genome sequence, light regulation with respect to morphology, growth, sporulation and protease production of *A. oryzae* strains were explored. The colonies resulted with circular stripe pattern containing white and green rings illustrating poor and rich spores besides mycelia formation when exposed to white light than in the dark in few and vice versa. Thus, the results indicate that *A. oryzae* perceives and responds to light as a trigger of conidiation and influence protease production. Hence light as one of the variables for enzyme optimization needs to be considered. Also, molecular mechanisms of photoreaction of this fungus would provide physiological significance for basic and also for biotechnological processes

Key words: *A. oryzae*, Acid protease, process optimization, bio- variables, Light