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Genetic improvement of lignin peroxidase enzyme production from *Phanerochaete chrysosporium*

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Abstract : Four different *Phanerochaete chrysosporium* strains collected and evaluated using two fermentation media and three incubation periods (5, 7 and 9 days) proved that the strain *P. chrysosporium* (PhC3) was the highest lignin peroxidase (LiP)producer and the medium 1(FM_1) combined with the incubation period 7 days were the best condition for LiP production. The highest LiP producer mutant, obtaining after UV-mutagenesis, was Kh-UV-4 since it showed 115 percent production higher than the original strain.Furthermore,the superior mutant Kh-EMS-9**,** obtaining after EMS-mutagenesis, was produced 171.25 percent production higher than the original strain. Moreover, the first and second crosses were carried out,on the intraspecific protoplast fusion level, between high LiP producer mutants. The enhancement of LiP productivity by these crosses reached up to 202.50 and 251.25 percent higher than the original strain (PhC3) for the fusants Kh-C1-4and Kh-C2-1, respectively.Three15-mer random primers were applied using RAPD technique to detect the molecular variation between three mutants and threefusants compared to their original strain. The results showed that many differences in RAPD banding patterns profile were detected as a result of mutagenic treatments and protoplast fusion. These differences confirmed the evidence of genetic variation in genomes after the mutagenic treatments and protoplast fusion crosses.

Key words : Improvement, lignin peroxidase, *P.chrysosporium*, Mutants, Fusants, RAPD-PCR.

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