

ABSTRACT

The present study discussed the production of thermophilic extracellular lipases from a mutant strain of *Rhizopus oligosporus* using different conditions and parameter. Fifty different strain of *R. oligosporus* were isolated from soil and food samples, from which 20 was selected through primary screening. After that Is-9 (31 ± 1.55 U/g) were selected as a highest producer of lipase enzyme. The wild type of Is-9 strain were mutated to improve the production of lipase enzyme by different EMS, MMS and alternative EMS/MMS treatment concentration. Among which EM-7 was selected as it shows maximum of 72 ± 3.60 U/g of lipase activity. The resistant strain of selected strain was developed using L-cysteine HCL to protect it from back mutation and environmental condition. To enhance the production of lipase enzyme different parameters were investigated and lipase activity was calculated. It was observed under optimize condition at pH 7, temperature 30 °C, incubation period 64 h and addition of beef extract and olive oil increased the lipase activity up to 185 U/g. The crude enzyme was purified by ammonium sulfate precipitation method (40-80 %) yielding 67 % purified enzyme. The molecular weight of the enzymes from both wild and mutant strain was found to be 33 kDa. Besides, the enzyme preparation extracted from the fungi and its mutant strain was used to treat the olive mill waste water. The % T_{595nm} indicated a comparison between the enzyme from wild type and mutant strain for the treatment of wastewater. Hence, it was concluded that the mutant strain enzyme not only showed more activity but also treated the waste water effectively then wild type. Thus, it could be of great value in waste treatment and management.