

Research Title ISOLATION OF PROTEASE PRODUCING MICROORGANISMS FOR CATALYZING  
SUGAR FATTY ACID ESTERS IN ORGANIC SOLVENTS

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## ABSTRACT

Eight strains of bacteria producing organic solvent stable alkaline protease were isolated from soil samples. Among them, *Pseudomonas aeruginosa* strain SU2 could produce the protease highly stable in tested organic solvents. The protease was purified to homogeneity with the purification fold of 58.4 and 33.2% yield. The molecular mass and pI were determined to 33.86 kDa and 6.25, respectively. The protease had an optimum pH of 8.0 and optimum temperature of 50 °C. The enzyme was stable in pH range 6.0 to 8.0 and temperature below 20 °C. The protease activity was enhanced by  $\text{Ba}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$ , while the inhibitory effect of  $\text{Co}^{2+}$ ,  $\text{Cu}^{2+}$  and  $\text{Zn}^{2+}$  was observed. The protease was inhibited by EDTA and 1,10 phenanthroline indicating that it belongs to the metalloprotease family. The purified protease was stable in 30-50% (v/v) of non-ionic detergents and 30% (v/v) oxidizing agent. The enzyme was stable in 75% (v/v) toluene with the half life of 30 hr. A crude protease from *Pseudomonas aeruginosa* SU2 could catalyze the synthesis of trehalose ester in DMF:DMSO (1:1 v/v) with the retention time of 6.24 min as analyzed by HPLC equipped with RI detector.

**Key words:** Protease, Organic solvents, Sugar Esters, Green Technology