

## Effect of Some Metal Ions on the Activity of Lipase Produced by *Aspergillus Niger* Cultured on *Vitellaria Paradoxa* Shells

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**Abstract :** Lipases (triacylglycerol acyl hydrolases) (EC 3.1.1.3) are class of enzymes that catalyses the hydrolysis of triglycerides to glycerol and free fatty acids. They account for up to 10% of the enzyme in the market and have a wide range of applications in biofuel production, detergent formulation, leather processing and in food and feed processing industry. This research was conducted to study the effect of some metal ions on the activity of purified lipase produced by *Aspergillus niger* cultured on *Vitellaria paradoxa* shells. Purified lipase in 12.5 mM p-NPL was incubated with different metal ions ( $\text{Zn}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Mn}^{2+}$ ,  $\text{Fe}^{2+}$ ,  $\text{Na}^+$ ,  $\text{K}^+$  and  $\text{Mg}^{2+}$ ). The final concentrations of metal ions investigated were 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9 and 1.0 mM. The results obtained from the study showed that  $\text{Zn}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Mn}^{2+}$  and  $\text{Fe}^{2+}$  ions increased the activity of lipase up to 3.0, 3.0, 1.0, and 26.0 folds respectively. Lipase activity was partially inhibited by  $\text{Na}^+$  and  $\text{Mg}^{2+}$  with up to 88.5% and 83.7% loss of activity respectively. Lipase activity was also inhibited by  $\text{K}^+$  with up to 56.7% loss in the activity as compared to in the absence of metal ions. The study concluded that lipase produced by *Aspergillus niger* cultured on *Vitellaria paradoxa* shells can be activated by the presence of  $\text{Zn}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Mn}^{2+}$  and  $\text{Fe}^{2+}$  and inhibited by  $\text{Na}^+$ ,  $\text{K}^+$  and  $\text{Mg}^{2+}$ .

**Keywords :** *Aspergillus niger*, *Vitellaria paradoxa*, lipase, metal ions

**Conference Title :** ICBBB 2019 : International Conference on Bioscience, Biotechnology, and Biochemistry

**Conference Location :** New York, United States

**Conference Dates :** December 09-10, 2019