

Purification and Characterization of Lipase from Local Isolate of *Aspergillus aculeatus* and Study of Inhibition Effect of Sunflower Seeds Extract

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ABSTRACT

We have isolated the lipase-producing fungi from the soil, cheese and whey, and isolate A6 chosen because of its high lipolytic ability, and diagnosed using morphological tests as *Aspergillus aculeatus*. The enzyme was purified by 40% saturation of ammonium sulphate precipitation with 6.25 fold and 66.4% recovery, and by gel filtration on Sephacryl S-200, with 18.05 fold and 16.4% recovery.

The results of the enzyme characterization showed that its estimated optimum pH of activity was 7.5 and its optimum pH of stability was 6.5-8.5. The

optimum temperature for the activity was 30°C, and the enzyme was retained its original activity after incubation at temperature 30 °C and less.

The enzyme activity increased when using tributyrin and tricaprinn as a substrate, where activity was 92 and 86 units/ml respectively, while the activity was decreased when use tristearin and triolein as a substrate, where activity was 56 and 47 units/ml, respectively.

Calcium led to increased activity of the enzyme, while sodium and magnesium ions did not affect, and the use of zinc, mercury has reduced activity.

The use of EDTA and β -Mercaptoethanol led to reduced activity and the enzyme

activity was not, affected by non-ionic detergents Tween-80 and Triton X-100 while the enzyme activity was reduced when treated with SDS and the activity was reduced when treated with organic solvent acetone and ethanol.

Km of the enzyme was 1.6 mg/ml and Vmax was 129.3 mM/min using Tributyrin as a substrate. The addition of sunflower seeds extract reduced Vmax while not affecting km, so this type of inhibitors is reversible non-competitive inhibitors.