

Effect of Organic Solvents and Metal Ions on Lipase Activity of LK3 Isolate from Compost Metagenome

ABSTRACT

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Lipase is one of the lipolytic enzymes that has an important role in various industries such as food, detergents, cosmetics, biomedicine, biosurfactants, biodiesel, enantiomeric pharmaceutical products and the synthesis of organic compounds. Another interesting thing about lipase is enantioselectivity, regioselectivity and active in organic solvents. LK3 isolate lipase is one of the lipase obtained from compost through the metagenome approach. This study aims to determine the effect of organic solvents and metal ions on lipase activity of LK3 isolate. The method includes the production of LK3 isolate lipase to obtain crude extracts followed by partial purification through dialysis. Purified enzymes were tested by adding various of organic solvents and metal ions. Lipase activity test was carried out under optimum conditions. The results show that LK3 isolate lipase has high stability in nonpolar solvents (high of $\log P$ values) such as n-hexane, chloroform and isoamilalkohol and n-propanol. Meanwhile, LK3 isolate lipase showed low stability in polar solvents (low $\log P$ values) such as methanol, ethanol, acetone and acetonitrile. Monovalent metal ions such as K^+ provide a decrease in lipase activity. Whereas, some divalent and trivalent metal ions such as Ni^{+2} , Fe^{+2} , Zn^{+2} , Mg^{+2} , Co^{+2} , Ca^{+2} and Fe^{+3} provide an increase in lipase activity. Based on these results, it was concluded that the LK3 isolate lipase can be used in organic reactions and requires the presence of cofactors in its activity.

Keywords: *lipase, Metagenome, Compost, organic solvent, metal ion*