

Research Title	Production of PLLA-degrading enzyme by <i>Actinomadura keratinilytica</i> T16-1 using solid state fermentation
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Poly lactic acid (PLA) is a biodegradable plastic. It was reported to degrade by various microorganisms. *Actinomadura keratinilytica* strain T16-1 was demonstrated high ability to degrade PLA under various conditions. However, PLA-degrading enzyme production under solid state fermentation has not studied so far. This research aimed to optimize PLA-degrading enzyme production by *Actinomadura keratinilytica* strain T16-1 using agricultural wastes as substrate under solid state fermentation. Three agricultural wastes (duckweed, cassava ship, soybean meal) were tested for PLA-degrading enzyme production by statistical method with mixture design. The effect of vermiculite was studied by adding into the substrate for the enzyme production. According to the result of response surface method revealed that duckweed without supplement with vermiculite demonstrated the highest enzyme production (137 U/g substrate). The optimum medium composition was further determined. The maximum enzyme activity of 391 U/g substrate was obtained under the condition as follow 0.280 g PLA/10g substrate, 10 g duckweed and 60% moisture content. The enzyme production was scaled up to 10 kg solid state fermenter. The highest enzyme activity at 76 U/g was achieved after incubation at 40 °C for 168 h.

Keywords: *Actinomadura keratinilytica* Duckweed Mixture design Solid state fermentation Tray fermentation PLLA-degrading enzyme