

Produksi lipase dari bacillus subtilis dengan fermentasi terendam menggunakan substrat minyak jelantah = Lipase production from bacillus subtilis with submerged fermentation using waste cooking oil as the substrate

Maharani Suci, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20456506&lokasi=lokal>

Abstrak

Penggunaan bakteri sebagai mikroorganismenya untuk menghasilkan lipase sedang dikembangkan karena memiliki keuntungan untuk diproduksi skala besar. Kultur *Bacillus subtilis* ditumbuhkan dalam substrat minyak jelantah menggunakan metode fermentasi terendam SmF. Aktivitas enzim dioptimasi dengan melakukan variasi konsentrasi inokulum, substrat, sumber nitrogen, inducer, serta ion logam Ca^{2+} pada suhu $30^{\circ}C$ selama 84 jam fermentasi. Aktivitas lipolitik diukur menggunakan metode titrasi dengan reaksi hidrolisis. Aktivitas maksimum diperoleh saat konsentrasi inokulum 5 v/v, konsentrasi minyak jelantah 4 v/v, konsentrasi ekstrak ragi 0.5 w/v, konsentrasi minyak zaitun 0.25 v/v, dan konsentrasi ion logam Ca^{2+} 10 mM di dalam medium pertumbuhan. Kemudian, ekstrak basah lipase dikeringkan dengan spray dryer dan menghasilkan 17,33 gr ekstrak kering dari 500 mL ekstrak basah. Ekstrak kering enzim lipase dianalisis aktivitasnya dengan menggunakannya sebagai biokatalis reaksi interesterifikasi sintesis biodiesel rute non-alkohol pada reaktor batch dengan perbandingan mol reaktan minyak kelapa sawit dan metil asetat 1:12 pada suhu reaksi $40^{\circ}C$ selama 50 jam.

.....Bacterial lipase has been developed lately because of its advantage to produce with large scale. Culture of *Bacillus subtilis* were grown to produce lipase in Waste Cooking Oil WCO using submerged fermentation SmF method. The enzyme activity of the culture was improved by using different concentration of inoculum, substrate, nitrogen source, inducer, and Ca^{2+} ion at $30^{\circ}C$ for 84h fermentation. Lipolytic activity of crude lipase was determined using titrimetry method with hydrolysis reaction. Maximum activity of lipase 4.96 U mL was found at 5 v v inoculum, 4 v v WCO, 0.5 w v yeast extract, 0.25 v v olive oil, and 10 mM Ca^{2+} that present in medium culture. Later, the crude lipase has been dried with spray dryer and resulting 17.33 gr of dry lipase powder per 500 mL crude lipase. Furthermore, dry lipase powder was analyzed its activity by utilizing it as a biocatalyst for interesterification reaction in non alcohol route of biodiesel synthesis in batch reactor with mole comparison 1 12 of reactant palm oil and methyl acetate in $40^{\circ}C$ of reaction temperature and 50 hour cycle.