

PENGARUH VARIASI KECEPATAN AGITASI TERHADAP PRODUKSI LIPID DARI ISOLAT FUNGI BR. 2.2

Oleh

Adriana Tita Suryawati

16/393139/BI/09559

INTISARI

Biodiesel merupakan salah satu energi alternatif yang dapat bersumber dari mikrobial *oleaginous*. Pemanfaatan mikrobial *oleaginous* semakin dikembangkan seiring dengan kebutuhan sumber energi alternatif berupa *single cell oil*. Isolat BR 2.2 digolongkan sebagai organisme *oleaginous* karena kemampuannya dalam mengakumulasi lipid sebesar 28.44% dari total biomassa keringnya. Kecepatan agitasi dalam proses produksi lipid merupakan salah satu faktor yang penting untuk efektivitas proses dan biaya produksi yang diperlukan. Penelitian ini dilakukan untuk mengetahui pengaruh kecepatan agitasi dan waktu inkubasi terhadap produksi biomassa dan profil lipid pada isolat BR 2.2 dengan *submerged fermentation*. Tahapan produksi biomassa dan lipid isolat BR 2.2 dilakukan pada kecepatan agitasi 0 rpm, 50 rpm, 100 rpm, 150 rpm, dan 200 rpm. Setiap waktu inkubasi 0 jam, 48 jam, 96 jam, dan 144 jam dilakukan pengunduhan produk berupa biomassa total, lipid, dan sisa glukosa dan nitrogen dalam medium produksi yang diukur dengan analisis DNS dan Kjeldahl. Pengukuran pertumbuhan diketahui berdasarkan pertambahan ukuran diameter pelet. Hasil produksi paling tinggi terjadi pada perlakuan 100 rpm dengan biomassa total mencapai 2,78 gr/L dan total lipid 0,63 gr/L selama 144 jam inkubasi. Keunikan pada isolat BR 2.2 dalam produksi lipid terlihat dari persentase konsumsi nitrogen $\leq 42,57\%$ dari total nitrogen yang diberikan dalam medium produksi. Berdasarkan penelitian yang dilakukan dapat disimpulkan bahwa adanya kecepatan agitasi dan waktu inkubasi berpengaruh terhadap produksi biomassa total dan lipid dalam medium produksi.

Kata kunci : Isolat BR 2.2, kecepatan agitasi, waktu inkubasi, oksigen, biomassa, lipid.

THE EFFECT OF VARIOUS AGITATION SPEED ON LIPID PRODUCTION FROM FUNGAL BR. 2.2 ISOLATE

by

Adriana Tita Suryawati

16/393139/BI/09559

ABSTRACT

Biodiesel is an alternative energy that can be sourced from oleaginous microbes. The utilization of oleaginous microbes is increasingly being developed along with the need for alternative energy sources in the form of single-cell oil. BR 2.2 isolates are classified as oleaginous organisms because of their ability to accumulate lipids for 28.44% of the total dry biomass. The speed of agitation in the lipid production process is one of the major factors for the effectiveness of the production process and the production costs. This study was conducted to determine the effect of the agitation speed and the incubation time on biomass production and lipid profile of BR 2.2 isolate by submerged fermentation. The stages of biomass and lipid production of BR 2.2 isolate were carried out at agitation speeds of 0 rpm, 50 rpm, 100 rpm, 150 rpm, and 200 rpm. Each incubation time of 0 hours, 48 hours, 96 hours, and 144 hours, the product was harvested in the form of total biomass, lipids, and residual glucose, and nitrogen in the production medium as measured by DNS and Kjeldahl analysis. Measurement of growth is known based on the increase in the size of the pellet diameter. The highest production yield occurred at 100 rpm with a total biomass of 2.78 g/L and a total lipid of 0.63 g/L for 144 hours of incubation. The uniqueness of the BR 2.2 isolate in lipid production was seen from the percentage of nitrogen consumption which was $\leq 42.57\%$ of the total nitrogen given in the production medium. Based on the research conducted, it can be concluded that the agitation speed and incubation time affect the production of total biomass and lipids in the production medium.

Keywords : BR 2.2 isolate, agitation speed, incubation time, oxygen, biomass, lipid