

PENAPISAN PRIMER KHAMIR GENUS *Rhodotorula* KOLEKSI Indonesian Culture Collection (InaCC) SEBAGAI PENGHASIL LIPID

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INTISARI

Bahan bakar fosil masih menjadi sumber energi terbesar secara global. Penggunaan bahan bakar fosil meningkatkan pemanasan global dan tidak terbarukan sehingga diperlukan sumber energi alternatif, seperti biodiesel. Lipid khamir *oleaginous* berpotensi sebagai bahan baku biodiesel. *Rhodotorula* merupakan genus yang memiliki potensi tersebut. *Rhodotorula* banyak ditemukan di Indonesia, namun potensi akumulasi lipidnya belum diketahui. Penelitian ini bertujuan untuk mempelajari kemampuan khamir *Rhodotorula* dalam menghasilkan lipid yang berpotensi sebagai bahan baku biodiesel. Penelitian ini menggunakan 30 strain *Rhodotorula* milik InaCC BRIN. Metode penelitian meliputi uji kualitatif untuk mengelompokkan khamir *oleaginous* dan *non-oleaginous*; dan uji kuantitatif untuk menganalisis produktivitas lipid, kadar C dan N, serta profil lipid. Hasil menunjukkan terdapat lima strain yang merupakan penghasil lipid baik. Kelima strain tersebut adalah *Rhodotorula graminis* Y112, *Rhodotorula mucilaginosa* Y113, *Rhodotorula mucilaginosa* Y793, *Rhodotorula* sp. Y1512, dan *Rhodotorula* sp. Y1516. *Rhodotorula mucilaginosa* Y113 memiliki produktivitas lipid tertinggi (19.42 %) dalam 48 jam. Dalam waktu inkubasi 72 jam, *Rhodotorula mucilaginosa* Y113 menghasilkan berat kering sel tertinggi pada jam ke-72 (9.79 g/L), serta berat lipid tertinggi pada jam ke-36 (1.384 g/L). Berdasarkan hasil uji One-Way ANOVA, variasi waktu inkubasi berpengaruh signifikan terhadap kadar C dan N dalam medium. Hasil analisis profil asam lemak menunjukkan *Rhodotorula mucilaginosa* Y113 mengandung sepuluh jenis asam lemak. Jenis asam lemak dengan jumlah tertinggi adalah asam oleat (71.64 %) dan asam palmitat (17.08 %). Asam oleat merupakan salah satu komponen penting dalam biodiesel. Hasil tersebut menunjukkan bahwa khamir *Rhodotorula* berpotensi untuk menghasilkan lipid yang dapat digunakan sebagai bahan baku biodiesel.

Kata Kunci: Khamir *oleaginous*, *Rhodotorula mucilaginosa*, Biodiesel, Asam oleat, Asam Palmitat

PRIMARY SCREENING OF *Rhodotorula* YEAST STRAIN FROM INDONESIAN CULTURE COLLECTION (*InaCC*) AS LIPID PRODUCER

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ABSTRACT

Fossil fuels are the largest source of energy globally. Fossil fuel utilization can increase global warming and not renewable, thus alternative energy sources such as biodiesel are needed. Oleaginous yeast lipids have the potential as biodiesel feedstocks. *Rhodotorula* is genus that has this potential. *Rhodotorula* commonly found in Indonesia, but its lipid accumulation potential is not well studied. The purpose of this study is investigate *Rhodotorula* ability to produce lipids that have potential as biodiesel feedstocks. This study used 30 *Rhodotorula* strains from *InaCC*-BRIN. The research method includes qualitative analysis to categorize oleaginous and non-oleaginous yeasts, quantitative analysis to analyze lipid productivity, C and N levels, and lipid profiles. The results show five strains are good lipid producers, *Rhodotorula graminis* Y112, *Rhodotorula mucilaginosa* Y113, *Rhodotorula mucilaginosa* Y793, *Rhodotorula* sp. Y1512, and *Rhodotorula* sp. Y1516. *Rhodotorula mucilaginosa* Y113 strain has the highest lipid productivity (19.42%) in 48 hours. In 72-hour incubation, strain *Rhodotorula mucilaginosa* Y113 produced highest dry cell weight at hour-72 (9.79 g/L) and the highest lipid weight at hour-36 (1.384 g/L). Based on One-Way ANOVA results, incubation time variation had significant effect on C and N levels in the medium. The fatty acid profile analysis showed that strain *Rhodotorula mucilaginosa* Y113 comprised of ten fatty acids types. The most common fatty acid was oleic acid (71.64%) and palmitic acid (17.08%). Oleic acid is one of the important components of biodiesel. These results show that *Rhodotorula* yeast has potential to produce lipids that can used as biodiesel raw material.

Keywords: Oleaginous yeast, *Rhodotorula mucilaginosa*, Biodiesel, Oleic acid, Palmitic acid