Pengaruh nutrisi dan waktu sonikasi terhadap hasil ekstraksi lipid mikroalga chlorella vulgaris = Effect of nutrition and ultrasonication time on lipid accumulation of chlorella vulgaris

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Abstrak

[Untuk mengevaluasi potensi dari mikroalga hijau Chlorella vulgaris sebagai sumber produksi biodiesel, dipelajari efek senyawa nitrogen, besi, dan waktu sonikasi pada laju pertumbuhan C.vulgaris serta total akumulasi lipid yang didapat. Laju pertumbuhan pada media dengan penambahan 0,67 mg/L Fe3+ lebih tinggi dibandingkan dengan pertumbuhan pada media dengan pengurangan 75,41% kadar nitrogen. Produktivitas biomassa menurun pada media dengan defisiensi nitrogen dan meningkat pada media dengan penambahan besi (87,79% dan 122,67% berturut-turut), sedangkan produktivitas lipid ditemukan meningkat pada kedua jenis media (246,15% dan 169,23% berturut-turut). Tidak ditemukan efek yang signifikan terhadap total hasil ekstraksi mikroalga C.vulgaris ketika digunakan waktu sonikasi selama 15, 30, dan 45 menit. Sebagai tambahan, kemungkinan kultivasi mikroalga di ruang terbuka turut diteliti. Didapatkan laju pertumbuhan yang lebih rendah pada kultivasi di luar ruangan karena rendahnya faktor pencahayaan. .....To evaluate the potential of green microalgae Chlorella vulgaris as a feedstock for biodiesel production, the effect of nitrogen, iron, and sonication time on growth of C.vulgaris along total lipid collected were studied. The growth rate is higher when 0,67 mg/L Fe3+ was added, while the growth in media with 75,41% nitrogen deficiency is slower. Biomass productivity was lower in N-deficient media and higher in iron suplemented media (87,79% and 122,67% respectively), while lipid productivity was higher in both media (246,15% and 169,23% respectively). There is no significance effect in total lipid collected from microalga C.vulgaris when using 15, 30, and 45 minute sonication time. In addition, the feasibility of cultivating the microalga in outdoor condition was also tested. It was found that the growth of microalga become slower due lack of illumination in outdoor cultivation., To evaluate the potential of green microalgae Chlorella vulgaris as a feedstock for biodiesel production, the effect of nitrogen, iron, and sonication time on growth of C.vulgaris along total lipid collected were studied. The growth rate is higher when 0,67 mg/L Fe3+ was added, while the growth in media with 75,41% nitrogen deficiency is slower. Biomass productivity was lower in N-deficient media and higher in iron suplemented media (87,79% and 122,67% respectively), while lipid productivity was higher in both media (246,15% and 169,23% respectively). There is no significance effect in total lipid collected from microalga C.vulgaris when using 15, 30, and 45 minute sonication time. In addition, the feasibility of cultivating the microalga in outdoor condition was also tested. It was found that the growth of microalga become slower due lack of illumination in outdoor cultivation.]