Seleksi bakteri pelarut fosfat dan kajian produksi sel bakteri terpilih menggunakan medium pikovskaya dengan modifikasi sumber karbon (C) dan nitrogen (N) = Screening of phosphate solubilizing bacteria and study of producing selected bacteria cell by using pikovskaya medium with carbon (C) and nitrogen (N) modification

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Abstrak

Seleksi bakteri pelarut fosfat dan kajian produksi sel bakteri terpilih menggunakan medium Pikovskaya dengan modifikasi sumber karbon (glukosa teknis dan molase) dan nitrogen (urea dan tepung ikan) telah dilakukan. Penelitian bertujuan menyeleksi 20 isolat bakteri yang memiliki aktivitas pelarut fosfat terbaik dalam medium mengandung senyawa Ca3(PO4)2 dan batuan fosfat serta mengkaji komposisi medium produksi sel bakteri pelarut fosfat isolat terpilih menggunakan medium Pikovskaya dengan variasi sumber karbon dan sumber nitrogen. Produksi sel dilakukan selama 48 jam menggunakan 5 variasi medium Pikovskaya dengan komposisi sumber karbon dan nitrogen yang berbeda (M1, M2, M3, M4, dan M5). Metode Total Plate Count (TPC) digunakan untuk menghitung jumlah sel bakteri yang diuji tiap interval 6 jam.
Hasil penelitian menunjukkan isolat GRTL 6.2 dan GRTL 7.3 diidentifikasi sebagai Burkholderia seminalis dan Burkholderia cenocepacia. Identifikasi bakteri dilakukan oleh Indonesia Culture Collection (InaCC), LIPI, Cibinong. Kedua isolat memiliki rata-rata indeks pelarutan fosfat (IPF) tertinggi dengan nilai masing-masing 4,38 dan 3,92, selanjutnya digunakan dalam tahap kajian produksi sel BPF. Jumlah sel kedua isolat pada akhir masa inkubasi (48 jam) berkisar 5,4 - 5,6x1013 CFU/ml.
Data statistik dengan uji Anova (P>0,05) menunjukkan jumlah sel kedua isolat pada kelima medium perlakuan tidak terdapat perbedaan nyata. Glukosa teknis dan molase dapat menggantikan glukosa sebagai sumber karbon, sedangkan urea dan tepung ikan dapat menggantikan yeast extract sebagai sumber nitrogen untuk produksi sel bakteri pelarut fosfat.
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Screening of phosphate solubilizing bacteria (PSB) and study of producing selected bacteria cell by using Pikovskaya medium with carbon source (technical glucose and molasses) and nitrogen (urea and fish meal) modification have been done. This research aims at selecting 20 bacterial isolates that have phosphate solubilizing activity in Pikovskaya medium with a compound Ca3(PO4)2 and phosphate rock as well as examining the composition of production medium of the PSB cell selected using Pikovskaya medium with a variety of carbon and nitrogen sources. Cell production was done within 48 hours by using five types of medium Pikovskaya with different variations in the composition of carbon and nitrogen sources (M1, M2, M3, M4, and M5). Total Plate Count (TPC) method was used to calculate the number of bacterial cells that were tested with 6 hours interval each.
The result shows isolates GRTL 6.2 and GRTL 7.3 were identified as Burkholderia seminalis and Burkholderia cenocepacia. Identification of bacteria carried by Indonesia Culture Collection (InaCC), LIPI Cibinong. Both isolates had an average of phosphate solubilizing index (PSI) with the highest value of each is 4.38 and 3.92, and they are later used in the assessment stage of PSB cell production. Results calculation

the two isolates cell numbers at the end of the incubation period (48 hours) is 5,4 - 5,6x1013 CFU/ml. Statistical data by Anova (P> 0.05) showed that there is no real difference in an average yield of TPC of both isolates in the fifth treatment medium. Technical glucose and molasses can replace glucose as the carbon source whereas urea and fish flour can replace yeast extract as nitrogen source in the Pikovskaya medium for the production of phosphate solubilizing bacterial cells.