KAJIAN PENGARUH LIMBAH PENYAMAKAN KULIT TERHADAP VIABILITAS DAN AKTIVITAS PELARUTAN ISOLAT BAKTERI PELARUT FOSFAT

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ABSTRAK

Air limbah penyamakan kulit merupakan salah satu kelompok zat pencemar yang digolongkan sebagai bahan pencemar dan berbahaya, terutama kandungan kromium (Cr) di dalam air limbah. Apabila kandungan Cr melebihi baku mutu maka akan berdampak bagi kesehatan lingkungan terutama pada populasi mikrobia dalam tanah. Mikrobia dalam tanah berperan penting dalam meningkatkan kesuburan tanah, salah satunya yaitu bakteri pelarut fosfat. Penelitian bertujuan untuk mengetahui pengaruh limbah penyamak kulit terhadap viabilitas dan aktivitas bakteri pelarut fosfat dalam melarutkan fosfat. Limbah yang digunakan berasal dari industri penyamakan kulit PT. Lembah Tidar Jaya Magelang, Jawa Tengah, sedangkan bakteri pelarut fosfat yang digunakan merupakan bakteri yang diisolasi dari tanah di daerah sekitar pabrik. Penelitian dilakukan di Labolatorium Biologi Tanah, Prodi Ilmu Tanah, Universitas Pembangunan Nasional "Veteran" Yogyakarta. Metode penelitian menggunakan Rancangan Acak Lengkap (RAL), pengujian viabilitas bakteri menggunakan 2 faktor berupa kadar limbah dan waktu inkubasi, sedangkan pengujian aktivitas isolat bakteri dalam melarutkan fosfat mengunakan faktor tunggal yaitu kadar limbah. Parameter yang diamati adalah sifat kimia limbah, pertumbuhan/jumlah sel isolat bakteri, jumlah P terlarut, dan pH media. Hasil penelitian menujukkan bahwa limbah penyamakan kulit berpengaruh nyata terhadap pertumbuhan isolat bakteri B, terjadi penurunan jumlah sel sampai inkubasi 20 hari. Sedangkan pada isolat bakteri A tidak berpengaruh nyata. Limbah penyamakan kulit berpengaruh nyata terhadap aktivitas bakteri pelarut fosfat dalam melarutkan fosfat, penurunan pelarutan fosfat secara nyata terjadi pada perlakuan kadar limbah 100%. Perlakuan pemberian limbah penyamakan kulit dapat menurunkan viabilitas isolat bakteri A dan isolat bakteri B. Viabilitas isolat bakteri B menjadi negatif pada perlakuan pemberian kadar limbah 60%.

Kata kunci : bakteri pelarut fosfat, kromium (Cr), limbah penyamakan kulit, dan viabilitas.

STUDY OF LEATHER TANNING INDUSTRY WASTE EFFECT ON VIABILITY AND SOLUBILIZATION ACTIVITY OF PHOSPHATE SOLUBILIZING BACTERIA ISOLATE

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ABSTRACT

Waste water of leather tanning industry is one of pollutant that classified as hazardous and toxic, especially the content of chromium (Cr) in the waste water. When the levels of Cr exceeds quality standard, it will have an impact on environmental health, especially in microbia population in the soil. Microbes in the soil give an important role in increasing soil fertility, and one of which is phosphate solubilizing bacteria. The study aimed to determine the effect of leather tanning waste on the viability and activity of phosphate solubilizing bacteria in dissolving of phosphate. The source of wastewater that was used in this research was collected from tanning industry of PT. Lembah Tidar Jaya, Magelang, Jawa Tengah while the bacteria phosphate solubilizing which used are bacteria that was isolated from soil in the area around the factory. The research was conducted in Laboratorium Ilmu Tanah, Prodi Ilmu Tanah, Universitas Pembangunan Nasional "Veteran" Yogyakarta. The experimental design was the Completely Randomized Design, bacterial viability test used two factors which are waste water content and incubation time, while the test of phosphate solubilization bacteria activity used single factors which is waste water content. The parameters observed were chemical properties of waste water, growth/amount of bacteria isolated cell, the amount of dissolved P, and media pH. The result of this research showed that waste water of tannery industry had significant effect on growth of isolated B bacteria, decreasing the number of cells until 20 days incubation. Whereas the waste water of tannery industry had no significant effect on growth of isolated A bacteria. Waste water of leather tanning industry had significant effect on phosphate solvent bacteria in solubilization of phosphate. The decreasing of phosphate solubilization significantly occured on 100% waste water content treatment. Waste water of leather tanning industry treatment could reduce the viability isolated A bacteria and isolated B bacteria. the viability of isolated B bacteria became negative on 60% waste water content treatment.

Key words : phosphate solubilizing bacteria, chromium (Cr), waste of tannery, and viability.