

**KAJIAN PUSTAKA METODE DAN MATRIKS IMOBILISASI
BAKTERI DAN ENZIM UNTUK BIOREMEDIASI**

NASKAH TUGAS AKHIR

Sebagai salah satu syarat untuk memperoleh gelar sarjana farmasi

**FIRMAN ABDURRAHMAN
A161005**



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YAYASAN HAZANAH
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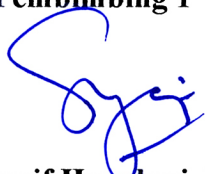
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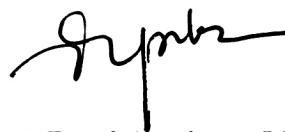
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Kutipan atau saduran baik sebagian ataupun seluruh naskah, harus menyebut nama pengarang dan sumber aslinya, yaitu Sekolah Tinggi Farmasi

*Naskah ini saya persembahkan untuk kedua
orangtua dan seluruh keluarga yang selalu menemani
baik suka maupun duka. Serta untuk kawan
seperjuangan*

ABSTRAK

Bioremediasi merupakan teknik atau proses detoksifikasi (menurunkan tingkat racun) dalam tanah atau lingkungan lainnya dengan menggunakan mikroorganisme atau enzim. Bioremediasi tidak menggunakan bahan kimia berbahaya, tidak melakukan proses pengangkutan limbah, teknik pengolahannya mudah diterapkan dengan biaya murah, namun penggunaan mikroba secara langsung menjadi salah satu masalah dalam proses bioremediasi dikarenakan tingkat patogen mikroorganisme dan kemudahan dalam proses penggunaan. Imobilisasi mikroba dapat melindungi mikroorganisme dalam matriks dengan daya hidup yang baik, penyimpanan jangka panjang, dan penggunaan yang mudah. Pemilihan metode dan matriks imobilisasi dilakukan dengan memperhatikan pada spesifikasi proses meliputi bahan bioaktif dan jenis limbah sebagai target. Berbagai parameter perlu menjadi pertimbangan pada penggunaan imobilisasi mikroba untuk bioremediasi, termasuk parameter aktivitas mikroorganisme, efektifitas bioremediasi, deaktivasi dan sifat regenerasi, serta tingkat bahaya matriks terimobilisasi. Matriks imobilisasi sudah banyak ditemukan dan digunakan untuk melakukan imobilisasi mikroba dan enzim. Pemilihan metoda imobilisasi disesuaikan dengan sifat fisika kimia matriks, tingkat ketahanan masing-masing pada penyimpanan, jumlah penggunaan kembali, dan efektivitas pada proses bioremediasi.

Kata kunci : Bioremediasi, Matriks imobilisasi, Imobilisasi mikroba

ABSTRACT

Bioremediation is a detoxification technique or process (lowering toxicity) in soil or other environments using microorganisms or enzymes. Bioremediation does not use hazardous chemicals, does not carry out the process of removing waste, the processing technique is easy to apply at low cost, but the use of microbes directly becomes one of the problems in the bioremediation process due to the level of pathogenic microorganisms and the ease of use in the process of use. Microbial immobilization can protect the microorganisms in the matrix with good viability, long-term storage, and easy use. The choice of method and immobilization matrix is carried out by paying attention to the process specifications including bioactive materials and types of waste as targets. Various parameters need to be considered in the use of microbial immobilization for bioremediation, including parameters of microorganism activity, bioremediation effectiveness, deactivation and regeneration properties, as well as the immobilized matrix hazard level. Immobilization matrices have been found and used to immobilize microbes and enzymes. The choice of the immobilization method is adjusted to the physical and chemical properties of the matrix, the level of resistance to the storage, the amount of reuse, and the effectiveness of the bioremediation process.

Keywords : *Bioremediation, Matrix immobilization, Immobilization of microbes*

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