

KARAKTER PERTUMBUHAN *Rothia* sp. SO3K DALAM BIOREMEDIASI LIMBAH CAIR RUMAH POTONG AYAM DENGAN PERLAKUAN AGITASI DAN KOMBINASI AGITASI-AERASI

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INTISARI

Limbah cair rumah potong ayam (RPA) memiliki kandungan bahan organik yang tinggi sehingga berpotensi mencemari lingkungan apabila tidak diolah dengan baik. Penelitian ini bertujuan untuk mengetahui kemampuan tumbuh *Rothia* sp. SO3K dalam menurunkan beban pencemar limbah cair RPA melalui proses bioremediasi dengan perlakuan agitasi dan kombinasi agitasi-aerasi. Bioremediasi dilakukan selama 4 hari menggunakan bioreaktor berisi 4 L limbah cair RPA. Parameter yang diamati meliputi pertumbuhan bakteri berdasarkan nilai OD600 dan *Total Plate Count* (TPC), serta efektivitas penurunan *total solid* (TS), *total volatile solid* (TVS), *total suspended solid* (TSS), *total dissolved solid* (TDS), *biological oxygen demand* (BOD), *chemical oxygen demand* (COD), kadar amonia, dan kadar nitrat. Data pertumbuhan dianalisis secara deskriptif, sedangkan efektivitas penurunan dianalisis menggunakan *independent T-test*. Hasil penelitian menunjukkan bahwa *Rothia* sp. SO3K mampu tumbuh pada kedua perlakuan, dengan pertumbuhan yang lebih tinggi pada kombinasi agitasi-aerasi. Efektivitas penurunan BOD, COD, TS, TVS, dan kadar nitrat berbeda nyata ($P < 0,05$) antara perlakuan agitasi dan kombinasi agitasi-aerasi. Perlakuan kombinasi agitasi-aerasi menunjukkan efektivitas bioremediasi limbah cair RPA oleh *Rothia* sp. SO3K yang lebih baik dibandingkan perlakuan agitasi.

Kata kunci: Bioremediasi, Agitasi, Agitasi-aerasi, Bioreaktor, *Rothia* sp. SO3K, Limbah cair rumah potong ayam

GROWTH CHARACTERISTICS OF *Rothia* sp. SO3K DURING THE BIOREMEDIATION OF POULTRY SLAUGHTERHOUSE WASTEWATER UNDER AGITATION AND AGITATION-AERATION TREATMENTS

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ABSTRACT

Poultry slaughterhouse wastewater (PSW) contains high concentrations of organic matter and may cause environmental pollution if not properly treated. This study aimed to evaluate the growth of *Rothia* sp. SO3K in reducing the pollutant load of PSW through bioremediation under agitation and combined agitation-aeration treatments. Bioremediation was conducted for four days using a bioreactor containing 4 L of PSW. The measured parameters included bacterial growth based on optical density at 600 nm (OD600) and Total Plate Count (TPC), as well as the removal efficiencies of total solids (TS), total volatile solids (TVS), total suspended solids (TSS), total dissolved solids (TDS), biological oxygen demand (BOD), chemical oxygen demand (COD), ammonia, and nitrate. Bacterial growth data were analyzed descriptively, whereas the removal efficiency data were analyzed using an independent *T*-test. The results showed that *Rothia* sp. SO3K was able to grow under both treatments, with greater growth observed under the combined agitation-aeration treatment. The removal efficiencies of BOD, COD, TS, TVS, and nitrate differed significantly ($P < 0,05$) between the agitation and combined agitation-aeration treatments. Overall, the combined agitation-aeration treatment showed better bioremediation performance of *Rothia* sp. SO3K in PSW than the agitation treatment.

Keywords: Bioremediation, Agitation, Agitation-aeration, Bioreactor, *Rothia* sp. SO3K, Poultry slaughterhouse wastewater