KARAKTERISASI PERTUMBUHAN DAN KEMAMPUAN NITRIFIKASI-DENITRIFIKASI SECARA AEROBIK *Brevibacterium* sp. SO1K DALAM MENGURAI BAHAN ORGANIK LIMBAH CAIR RUMAH POTONG AYAM

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INTISARI

Penelitian ini bertujuan untuk mengetahui karakter pertumbuhan isolat *Brevibacterium* sp. SO1K dalam medium yang mengandung limbah cair RPA dan kemampuannya dalam mengurai bahan organik melalui proses nitrifikasi-denitrifikasi secara aerobik untuk menjadi agen bioremediasi. Penelitian dilakukan dengan menumbuhkan *Brevibacterium* sp. SO1K pada medium cair dan padat dengan penambahan limbah cair RPA 0%, 25%, 50%,75%, dan 100%. Pertumbuhan dan viabilitas bakteri diamati selama 48 jam. Selanjutnya kemampuan *Brevibacterium* sp. SO1K dalam mereduksi amonia, nitrat, dan bahan organik limbah cair RPA diuji sebelum dan sesudah proses aerasi selama 4 hari. Variabel yang diamati yaitu pertumbuhan bakteri, viabilitas bakteri, nilai *Total Solid* (TS), *Total Volatile Solid* (TVS), *Total Suspended Solid* (TSS), *Total Dissolved Solid* (TDS), *Biological Oxygen Demand* (BOD5), *Chemical Oxygen Demand* (COD), kadar amonia, dan kadar nitrat. Data hasil peneitian dianalisis secara statistik menggunakan variansi Rancangan Acak Lengkap (RAL) pola searah dan dilanjutkan dengan uji beda *Duncan's Multiple Range Test* (DMRT). Hasil penelitian menunjukkan bahwa bakteri *Brevibacterium* sp. SO1K tumbuh optimal pada medium cair dan medium padat yang mengandung 25-50% limbah cair RPA. *Brevibacterium* sp. SO1K dapat melakukan aktivitas bioremediasi dengan perlakuan aerasi pada medium yang mengandung 100% limbah cair RPA dan mampu menurunkan konsentrasi BOD, COD, TS, TVS, TSS, TDS, amonia, dan nitrat. Hal ini dapat disimpulkan bahwa *Brevibacterium* sp. SO1K mampu menjadi agen bioremediasi untuk mendegradasi bahan organik pada limbah cair RPA dengan melakukan proses nitrifikasi-denitrifikasi.

Kata Kunci: *Brevibacterium* sp., nitrifikasi, denitrifikasi, bahan organik, limbah cair RPA, bioremediasi.

GROWTH CHARACTERIZATION AND THE ABILITY OF AEROBIC NITRIFICATION-DENITRIFICATION *Brevibacterium* sp. SO1K IN REDUCING ORGANIC MATERIALS CHICKEN SLAUGHTERHOUSE LIQUID WASTE

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ABSTRACT

The aim of this research was to determine the growth characteristics of *Brevibacterium* sp. SO1K in the media that contain chicken slaughterhouse liquid waste and its ability to reduce organic matter through the aerobic nitrification-denitrification process as a bioremediation agent. The research was conducted by growing *Brevibacterium* sp. SO1K in a liquid and solid media that contain chicken slaughterhouse (RPA) liquid waste at 0%, 25%, 50%, 75%, and 100%. Bacterial growth and viability was observed for 48 hours. The ability of *Brevibacterium* sp. SO1K to reduce ammonia, nitrate, and organic matter contained in liquid waste was tested before and after the aeration process for 4 days. The observed variables are bacterial growth, bacterial viability, the value of Total Solid (TS), Total Volatile Solid (TVS), Total Suspended Solid (TSS), Total Dissolved Solid (TDS), Biological Oxygen Demand (BOD$_5$), Chemical Oxygen Demand (COD), ammonia level, and nitrate level. The research data were analyzed statistically using analysis of variance with unidirectional patterns of Complete Randomized Design (CRD) and continued with Duncan's Multiple Range Test (DMRT). The results showed that *Brevibacterium* sp. SO1K has optimal of cell growth in medium containing 25-50% raw RPA liquid waste. *Brevibacterium* sp. SO1K can performing the bioremediation activities by aeration treatment on a medium containing 100% RPA liquid waste and reducing BOD, COD, TS, TVS, TSS, TDS, ammonia and nitrate concentration. It can be concluded that *Brevibacterium* sp. SO1K can be a bioremediation agent for degrading organic matter in RPA liquid waste by carrying out a nitrification-denitrification process.

Keywords: *Brevibacterium* sp., nitrification, denitrification, organic matter, chicken slaughterhouse liquid waste, bioremediation.