

## DEGRADASI BAHAN ORGANIK DAN REDUKSI AMONIA LIMBAH CAIR RUMAH POTONG AYAM (RPA) OLEH *Pseudomonas* sp. LS3K

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### INTISARI

Penelitian ini bertujuan untuk mengetahui pertumbuhan *Pseudomonas* sp. LS3K dalam medium yang mengandung limbah cair Rumah Potong Ayam (RPA) dan kemampuannya untuk menurunkan kadar amonia dan kadar bahan organik limbah dengan menjadi agen bioremediasi serta biotransformasi. Penelitian dilakukan dengan menumbuhkan bakteri *Pseudomonas* sp. LS3K pada medium cair limbah RPA dengan mengatur medium tersebut di pH 7 kemudian menggunakan konsentrasi limbah cair RPA sebesar 0%, 25%, 50%, 75%, dan 100%. Berdasarkan perlakuan tersebut kemudian dilihat kemampuan *Pseudomonas* sp. LS3K untuk dapat mereduksi ammonia dan bahan organik yang terdapat pada limbah cair RPA. Variabel yang diamati yaitu pertumbuhan bakteri, konsentrasi amonia, nilai *Biological Oxygen Demand* (BOD), *Chemical Oxygen Demand* (COD), *Total Solid* (TS), dan *Total Suspended Solid* (TSS). Setiap perlakuan dilakukan dengan replikasi sebanyak tiga kali. Data hasil penelitian dianalisis secara statistik menggunakan variansi Rancangan Acak Lengkap (RAL) pola searah dan dilanjutkan dengan uji beda *Duncan's Multiple Range Test* (DMRT). Hasil yang diperoleh menunjukkan bahwa *Pseudomonas* sp. LS3K dapat tumbuh di medium cair dan padat pada setiap perlakuan. Persentase penurunan terbesar nilai TS yaitu  $56,12 \pm 8,00\%$ , TVS  $77,93 \pm 9,54\%$ , TDS  $47,30 \pm 2,60\%$ , TSS  $84,27 \pm 15,40\%$ , BOD  $88,90 \pm 13,59\%$ , COD  $59,76 \pm 18,07\%$ , untuk kadar ammonia yaitu  $71,69 \pm 17,11\%$  pada P0. *Pseudomonas* sp. LS3K dapat menurunkan kadar ammonia dan bahan organik limbah cair RPA.

Kata kunci: limbah cair, rumah potong ayam, *Pseudomonas* sp. LS3K, nitrifikasi, bioremediasi.

## DEGRADATION OF ORGANIC MATERIALS AND AMMONIA REDUCTION WASTE LIQUID CHICKEN HOUSE BY *Pseudomonas* sp. LS3K

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### ABSTRACT

The aim of this research was to determine the growth of *Pseudomonas* sp. LS3K in the media that contain chicken slaughterhouse wastewater and its ability to reduce ammonia and organic matter levels as a bioremediation and biotransformation agent. The research was conducted by growing the *Pseudomonas* sp. LS3K in a liquid and solid media that contain chicken slaughterhouse wastewater at 0%, 25%, 50%, 75%, and 100%. Bacterial viability was also observed by inoculating bacteria that had been incubated in a liquid waste media for 24 and 48 hours in a solid nutrient medium. The ability of *Pseudomonas* sp. LS3K to reduce ammonia and organic matter contained in wastewater was tested before and after the bioremediation by aeration process for 4 days. This research consisted of 5 treatments, which were P0 100% waste without bacteria, P1 25% waste with 2% bacteria, P2 50% waste with 2% bacteria, P3 75% waste with 2% bacteria, and P4 100% waste with 2% bacteria. The data obtained included 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<sub>5</sub>), Chemical Oxygen Demand (COD), and ammonia level. Each treatment consisted of three replications. 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 *Pseudomonas* sp. LS3K could grow in both liquid and solid media for each treatment. The largest percentage reduction for the TS value was  $56,12 \pm 8,00\%$ , TVS  $77,93 \pm 9,54\%$ , TDS  $47,30 \pm 2,60\%$ , TSS  $84,27 \pm 15,40\%$ , BOD  $88,90 \pm 13,59\%$ , COD  $59,76 \pm 18,07\%$ , for ammonia level was  $71,69 \pm 17,11\%$  pada in P4. *Pseudomonas* sp. LS3K could reduce ammonia and organic matter levels in chicken slaughterhouse wastewater.

Keywords: wastewater, chicken slaughterhouse, *Pseudomonas* sp. LS3K, bioremediation.