

PEMANFAATAN *Pseudomonas sp. LS3K* SEBAGAI AGEN BIOREMEDIASI PADA LIMBAH CAIR INDUSTRI PENYAMAKAN KULIT

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INTISARI

Penelitian ini bertujuan untuk mengetahui kemampuan bioremediasi *Pseudomonas sp. LS3K* dalam mendegradasi bahan organik, mereduksi kromium, dan menurunkan emisi amonia pada limbah cair industri penyamakan kulit. Penelitian dilakukan dengan melihat pertumbuhan *Pseudomonas sp. LS3K* pada medium yang diberi limbah penyamakan kulit dengan konsentrasi limbah 0% dan 25%. Masing-masing medium diberi perlakuan berupa penambahan konsentrasi nutrisi antara lain 50%, 75%, dan 100%. Proses bioremediasi dilakukan selama 14 hari pada medium dengan penambahan konsentrasi limbah 25%, kemudian dilakukan penambahan 2% kultur bakteri. Medium pengujian bioremediasi diberi perlakuan penambahan konsentrasi molase antara lain 0% dan 1%. Pengambilan data untuk pengujian bioremediasi dilakukan pengulangan sebanyak 2 kali. Data yang didapatkan dari penelitian ini antara lain pertumbuhan bakteri, kadar COD, BOD, TDS, TSS, kromium total, amonia total, sulfida, kromium heksavalen, dan N total, kemudian data dianalisis deskriptif. Hasil penelitian menunjukkan bahwa *Pseudomonas sp. LS3K* mampu tumbuh pada medium limbah samak dengan konsentrasi 25%. Hasil bioremediasi hari ke-14 mengalami penurunan pada medium molase 0% untuk parameter COD sebesar 377,85 ppm; BOD 225,4 ppm; TSS 25,5 ppm; krom total 0,62 ppm; amonia total 16,77 ppm dan N total 73,33 ppm sedangkan pada medium molase 1% untuk parameter COD sebesar 2775 ppm; BOD 1640 ppm; TSS 24 ppm; krom total 2,1 ppm; amonia total 10,73 ppm dan N total 466,66 ppm. Parameter yang mengalami peningkatan pada hari ke-14 yaitu TDS sebesar 945 ppm pada medium molase 0% dan 860 ppm pada medium molase 1%. Kadar penurunan parameter krom heksavalen dan sulfida terlalu sedikit. Kesimpulan dari penelitian ini yaitu *Pseudomonas sp. LS3K* dapat mereduksi bahan organik, mereduksi kromium, dan menurunkan emisi amonia serta penambahan molase dapat meningkatkan kadar bahan organik pada limbah.

Kata kunci: Limbah penyamakan, *Pseudomonas sp. LS3K*, Molase, Bioremediasi.

UTILIZATION OF *Pseudomonas sp. LS3K* AS A BIOREMEDIATION AGENT IN THE LIQUID WASTE OF THE TANNERY INDUSTRY

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ABSTRACT

This research aims to determine the bioremediation ability of *Pseudomonas sp. LS3K* to degrade organic matter, reduce chromium, and reduce ammonia emissions in tannery industry wastewater. This research was conducted by conserving the growth of the bacteria liquid nutrient medium that added with by tannery waste with concentration of 0% and 25%. Each medium was treated with the addition of nutrient concentrations, included 50%, 75%, and 100%. The bioremediation was carried out for 14 days on the medium with the addition of a 25% concentration of tannery waste, then added 2% of bacterial culture. The bioremediation medium was treated with addition of molasses concentration, included 0% and 1%. Data collection for bioremediation tested was repeated 2 times. The data obtained from this research included bacterial growth, levels of COD, BOD, TDS, TSS, total chromium, total ammonia, sulfide, hexavalent chromium, and total N, were analyzed descriptively. The results showed that *Pseudomonas sp. LS3K* is able to grow in tannery waste medium with a concentration of 25%. The results of bioremediation for day 14 decreased in 0% molasses medium for COD parameters of 377,85 ppm; BOD 225,4 ppm; TSS 25,5 ppm; total chromium 0,62 ppm; total ammonia 16,77 ppm and total N 73,33 ppm; while in 1% molasses medium for COD parameters of 2775 ppm; BOD 1640 ppm; TSS 24 ppm; total chromium 2,1 ppm; total ammonia 10,73 ppm and total N 466,66 ppm. The parameters that increased on day 14 were TDS of 945 ppm in 0% molasses medium and 860 ppm in 1% molasses medium. The decrease in the hexavalent chromium and sulfide parameters was too low. The conclusion of this research is *Pseudomonas sp. LS3K* can reduce organic matter, reduce chromium, and the addition of molasses can increase organic matter in tannery waste.

Keywords: Tannery waste, *Pseudomonas sp. LS3K*, Molasses, Bioremediation.