

Bioremediation of Batik Liquid Waste for Various Colorings with Indigenous Bacteria as an Environmentally Friendly Waste Treatment

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ABSTRACT

The batik industry always produces waste. Liquid waste from the batik industry has a negative impact on the environment. This waste is generally colored and comes from the dyeing process, including Remazole, Naphthol, and Indigosol, so that the water cannot be used according to its intended purpose. Therefore, it is hoped that this research can increase the effectiveness of the decomposition of Remazol, naphthol, and indigosol dyes in batik liquid waste with bioremediation techniques using indigenous bacteria that are more efficient and environmentally friendly. This research is experimental. Batik liquid waste was taken from Batik Berkah Lestari, Giriloyo, Wukirsari, Imogiri, Bantul, D.I. Yogyakarta.. The research was carried out in six stages, as follows: 1. Sampling of batik dye waste from batik entrepreneurs 2. Physicochemical testing of Batik dye liquid waste at BBTKLPP (Balai for Environmental Health and Disease Control Engineering) Yogyakarta, including BOD, COD, TSS, TDS, Total Phenol, Total Crom, Total Ammonia, Sulfide, Temperature, pH, 3. Sterilization of tools 4. Isolation, characterization, and identification of indigenous bacteria in batik dye waste 5. Measuring the level of degradation or decolorization of batik dye waste by local bacteria. 6. Bacteria that are effective in degrading batik dye are then identified molecularly with 16S. Based on the research results, it can be concluded: 1. There were 15 bacterial isolates found, namely A (RZ T 10), B (RZ T 10), C (NP AT 7), D (NP AT 7), E (RZ T 8), F (NP T 13), G (NP T 13), H (RZ ID 4), I (NP ID 4), J (RZ NP 6), K (RZ ID 4), L (ID T 10), M (ID T 13), N (RZ AT 7), and O (NP AT 7). 2. Bacterial isolates that are effective in degrading batik waste dyes are 5, namely D (NP AT 7: *Stenotrophomonas maltophilia*) capable of degrading red naphthol and red remazol, H (RZ ID 4: *Stutzerimonas stutzeri*) capable of degrading batik waste dyes blue naphthol, methyl red, and blue, and I (NP ID 4: *Stutzerimonas stutzeri*) is able to reduce the natural color of indigofera. red and blue remazol, J (RZ NP 6: *Micrococcus* sp.) is able to reduce the natural color of indigofera and secang, blue and red indigosol, red remazol, and blue naphthol, and the fifth isolate N (RZ AT 7: *Pseudomonas* sp.) is able to degrade the natural color of indigofera and red remazole.

Kata Kunci: *bioremediation, batik dye waste, indigenous bacteria, isolation*