ABSTRACT

Yumna Husna Nisaa. 24020121410006. **Effectivity of Bacteria Industry wastewater Sayung Demak as a Biosorption Agent for Copper (Cu) and Zinc (Zn) Metals.** Under the guidance of Anto Budiharjo dan Sri Pujiyanto.

Metals that can pollute water are zinc (Zn) and copper (Cu). Reducing Zn and Cu metal pollution by bioremediation using bacteria isolated from polluted waters. The waters contaminated with zinc and copper metals are Sayung Demak waters. The purpose of this study was to isolate and identify bacteria from the Sayung Demak Ditch that are able to reduce copper and zinc metals. Water sampling was carried out at three locations. Location 1 (6°56′12″S110°31′26″E), location 2 (6°56′18″S 110°′30″50″E), and location 3 (6°56′22″S 110°30′51″E). Isolation of bacteria using the serial dilution method in nutrient agar media containing Zn and Cu 5 mg/L. Resistance test using Zn and Cu metal concentrations of 50 mg/L, 100 mg/L, and 150 mg/L. Analysis of the ability of bacteria to absorb metals was carried out twice, determined using Atomic Absorption Spectrophotometry and the image of bacterial cells was analyzed using a Scanning Electron Microscope. Bacterial isolates were identified using the 16S rRNA gene. The results obtained by 20 isolates include 17 Gram-posive and three Gram negative. Isolates YL18, YL315, YL319, and YL38 were resistant to a concentration of 150 mg/L of Zn and Cu metals. The results of the ANOVA test showed that bacterial isolates had significantly different abilities in absorbing zinc and copper metals with a P value <0.05. The bacterial isolate with the most effective Zn metal absorption ability at each concentration was isolate YL18 with bioremoval efficiency values (19%, 15%, 25%) while for Cu metal isolate YL315 with bioremoval efficiency values (66%, 55%, and 45%). Isolate YL18 was identified as the species Alcaligenes faecalis strain NBRC 13111 and isolate YL315 was identified as the species Delftia tsuruhatensis strain D9.

Keywords: Copper, Zinc, Biosorption, Bacteria, Scanning electron microscopy, Gen 16s rRNA