

SUMMARY

The Pertamina oil refinery industry located near the Donan River has the potential to become a source of heavy metal pollution in the aquatic environment, particularly Plumbum (Pb), a non-essential heavy metal that has accumulative and toxic properties. The high concentration of Pb resulting from these industrial activities reduces water quality and damages the ecosystem. The impact of high Pb concentrations in the aquatic environment can be observed from the survival of exposed organisms. *Diopatra claparedii* is an estuarine Polychaeta species found in the Donan River that has the ability to accumulate metals due to prolonged exposure to contaminated waters. The objectives of this research are to compare the survival of *D. claparedii* in different concentrations of Pb contaminated media and to obtain the concentration of Pb that affected the *D. claparedii* survival. The advantage of this research is to provide scientific information regarding the survival of *D. claparedii* in Pb contaminated media.

This experimental research was conducted in the laboratory using a Complete Random Design (CRD) with six levels of Pb treatment (0.30 (Control); 0.84; 1.38; 1.92; 2.45; 3.00 mg/L) and four replications, resulting in a total of 24 experimental units. The independent variables in this research were the Pb treatment in the media and the environmental factors. The parameters were Pb treatment levels of 0 (Control); 20; 40; 60; 80; and 100%, as for environmental factors, they were salinity, pH, and water temperature. The dependent variables were the survival of *D. claparedii* exposed to Pb contaminated media and the Pb residual concentration. The parameters were the number of *D. claparedii* that survived and experienced mortality for seven days, as well as the Pb residual concentration in water and sediment before and after Pb exposure. *D. claparedii* was exposed to Pb treatments for seven days. Pb concentrations in water and sediment were analyzed using Atomic Absorption Spectroscopy (AAS). The number of survive individuals in difference Pb concentrations of water and sediment before and after exposure was analyzed using one-way Permutational Multivariate Analysis of Variance. As for, the correlation of Pb in water and sediment with individual survival was analyzed using Pearson (r) and Ordinary Least Square regression. The Pb concentration that affected *D. claparedii* survival was descriptively analyzed.

The results indicate that the survival of *D. claparedii* significantly declined from 100 to 40% as the Pb concentration in the contaminated media increased. The result of PERMANOVA analysis showed that significant difference among Pb treatments, indicating that each Pb treatment had a significantly different effect. Most treatments showed significant differences ($p < 0.05$), but there were no significant differences between Pb 0.30 and 0.84 mg/L; 1.38 and 1.92 mg/L; as well as 1.92 and 2.45 mg/L ($p > 0.05$). These findings suggest that Pb concentrations of ≥ 0.84 mg/L significantly affect the survival of *D. claparedii* to 40%.

Keyword: *Diopatra claparedii*, Media, Mortal, Plumbum, Survival.