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PHYTOREMEDIATION IN INDUSTRIAL WASTEWATER INSTALLATION TECHNOLOGY UTILIZED PERUPUK (PHRAGMITESKARKA), KIAMBANG (SALVINIAMOLESTA)ANDPURUN TIKUS (ELEOCHARISDULCIS)

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ABSTRACT

The present research was aimed to prototype*ponds for treatment liquid* industrial waste water for rubber, *combined* with the local *aquatic plants for* diversification phytoremediation. The research was arranged in completely design with 4 treatments and 3 replications (3 weeks each). *The treatments given were as follows: T0 (without aquatic plants), T1 (Salvinia molesta), T2 (Phragmites karka), T3 (*Eleocharis dulcis*), T4 (combined). Parameter observed of Zn (63%) in the 21stday using Salvinia molesta, the only parameters that DO shown the value below the Standard of Water Quality (2 mg/l). Eleocharis dulcis Zn (20%), the reduction is still low. Parameters DO (2 mg/l) and pH (4.44) worth below but included the criteria of polluted. Phragmites karka thus increasing the levels of Zn in experimental ponds, i.e. by 17%. Model indoor instalation by using sediment filter bed that fits the life of Phragmites karka and Eleocharis dulcis in nature, obtained results purun unabel afford reduction of Zn (0%), parameters ofBOD5 (66.3 mg/l) and pH value 5 exceeds the Quality Standard criteria in liquid waste rubber. Phragmites karka with the use of a filter bed thus contributed 65% compared to 2 other plants. For water quality that is planted with Phragmites karka all parameters are still far from the standard value of Water Quality even from its 3 plants*

Keywords: Aquatic plant, Waste water, Rubber, Ponds, Phytoremediation

INTRODUCTION

Industrial liquid waste pollution problems rubber is one of the sources of the pollutants that lead to pollution of the aquatic environment. The industrial liquid waste can contaminate the waters of rubber are sourced from waste water in Latex processing into rubber sheet (Ribbed Smoked Sheet or RSS), which includes laundering, dilution, freezing and grinding as well as skimming (block cutting). In addition, the rubber production of similar Standard Indonesian Rubber (SIR).

The utilization and potential of aquatic plants as fitoremediasi in liquid industrial waste management installations have not yet developed many types of aquatic makrofita this is considered important because it is related to the rate of absorption of nutrients and elements of the water plant polluters. The effectiveness and efficiency of industrial liquid waste processing against the rate of absorption of nutrient depletion process also means that the content of the water chemistry parameters based on aquatic makrofita ability in absorbing elements of polluters and nutrients in sewage ponds.

The potential of local aquatic Purun (Eleocharis dulcis), Perupuk (Phragmites karka) and Salvinia (Salvinia molesta) have not been much researched in the effort of reducing industrial waste rubber which is a superior product in South Kalimantan in the sewage pond.

The aim of this research is to create the prototype applied to the liquid waste in industrial by utilizing diversifies phytoremediation aquatic plants.

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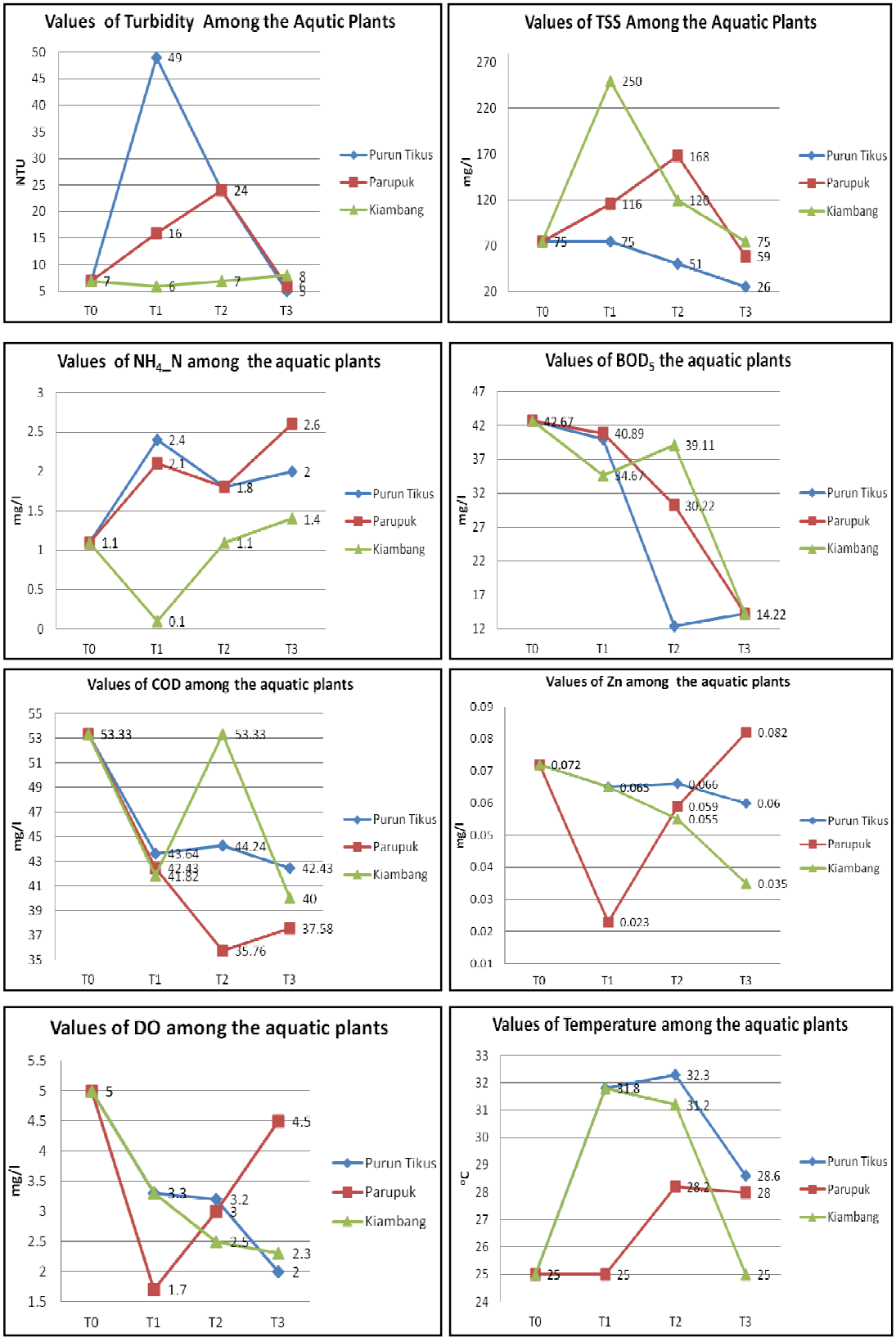

Figure 1. Values of Water Quality Parameters among the Aquatic Plants

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METHODS

As the target of this research is to produce plants that are able to reduce NH_3-N, total suspended solids, turbidity, temperature, BOD 5, COD, pH, heavy metals (Zn) with the Standard of Water Quality index.

RESULTS AND DISCUSSION

Based on the results of analysis of water quality of liquid waste to test growth and ability to survive on the aquatic plants at both the indoor installation models, informs that on the model of instalansi sediment pond rubber solid waste reduction potential of Zn (63%) in the 21stday using *Salvinia molesta*and of 9 parameters are observed, the only parameters that DO shown the value below the Standard of Water Quality (2 mg/l). *Eleocharis dulcis*, whereas the ability of Zn (20%), the reduction is still low but the value is still above the Standard of Water Quality (0.06 mg/l). Parameters DO (2 mg/l) and pH (4.44) worth below but included the criteria of polluted. *Phragmites karka* thus increasing the levels of Zn in experimental ponds, i.e. by 17%. This means the levels of Zn that had existed within the body of Phragmites karka aquatic plants thus released into the waters, and Phragmites karka does not have the ability to absorb existing in Zn liquid waste rubber. All the parameters are still within the range of the Standard Water Quality. Model indoor installation by using sediment filter bed that fits the life of *Phragmites karka* and *Eleocharis dulcis* in nature, obtained results purun unabel afford reduction of Zn (0%), but the value is still above the Standard Water Quality (0.06 mg/l). Parameters ofBOD5 (66.3 mg/l) and pH value 5 exceeds the Quality Standard criteria in liquid waste rubber. *Phragmites karka* with the use of a filter bed thus contributed 65% compared to 2 other plants. This means the levels of Zn that had existed in the body of aquatic. *Phragmites karka* thus released into waterways and accumulated in sediments due to the nature of the metal is a heavy type of suspended will be compared to the density of water. For water quality that is planted with *Phragmites karka* all parameters are still far from the standard value of Water Quality even from its 3 plants (see pigure 1). It is supported by Reddy and Smith(1987) *Eleocharis dulcis*lower levels of Fe > 20%, $S0_4$> 20%, and increases the pH > 15% water () achieved the result that the density of purun 50% in greenhouse experiment able to reduce the concentration of Fe water 76.5% and Kurniadie (2001) the utilization of plants Perupuk water waste process installation in sub surface for household wastewater shows the results it had a fairly high cleaning efficiency, especially for Biochemical Oxygen Demand (BOD_5), Chemical Oxygen Demand (COD). The average efficiency of cleaning for COD and BOD_5 is 85% > COD > 81% of cleaning efficiency, NH4-N >; 90% of cleaning efficiency and PO_4-P > 68% as well as the efficient use of cleaning coli bacteria > 99%.Aquatic plants are often considered weeds, due to rapid growth and doubling time (DT) is short, i.e. *Salvina molesta* (Hisbi, 1992), *Eleocharis dulcis* ecologically as a biofilter plants that able neutralizer the toxic elements and acidity sulfate by absorbing Fe amounted to 80,0-1.559 .5 ppm and of SO4 7,88-12,63 ppm (Atika, et al, 2009).

CONCLUSION

Parameter observed of Zn (63%) in the 21stday using Salvinia molesta,the only parameters that DO shown the value below the Standard of Water Quality (2 mg/l). Eleocharis dulcis Zn (20%), the reduction is still low. Parameters DO (2 mg/l) and pH (4.44) worth below but included the criteria of polluted. Phragmites karka thus increasing the levels of Zn in experimental ponds, i.e. by 17%. Model indoor instalation by using sediment filter bed that fits the life of Phragmites karka and Eleocharis dulcis in nature, obtained results purun unabel afford reduction of Zn (0%), parameters ofBOD5 (66.3 mg/l) and pH value 5 exceeds the Quality Standard criteria in liquid waste rubber. Phragmites karka with the use of a filter bed

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