

ABSTRAK

Detergen menjadi salah satu kebutuhan sehari-hari masyarakat untuk mencuci. Setelah mencuci menggunakan detergen maka air bekas cucian akan menjadi limbah detergen yang berbahaya bagi lingkungan akuatik karena di dalam detergen terdapat kadungan Linear Alkylbenzene Sulfonate (LAS) yang tidak dapat diuraikan oleh lingkungan. Untuk mengurangi pencemaran lingkungan akuatik dari limbah detergen peneliti membuat Bioremediasi dengan Menggunakan Biji Kelor (*Moringa oleifera*) untuk Mengurangi Efek Negatif dari Limbah Detergen terhadap Lingkungan. Dengan penelitian tersebut diharapkan dapat mengetahui efektifitas bioremediasi dengan menggunakan biji kelor dalam *trickling system bioremediator*. Dan mengetahui efektifitas bioremediasi dengan menggunakan biji kelor dalam *trickling system bioremediator* dalam mengurangi dampak negatif bagi lingkungan akuatik.

Hasil penelitian menunjukkan penurunan kadar Linear Alkylbenzene Sulfonate (LAS), dimana kadar LAS sebelum perlakuan yaitu 0.02068 ppm sedangkan kadar LAS setelah perlakuan yaitu 0.02050 ppm. Penurunan kadar LAS merupakan salah satu indikator air lebih baik. Hasil penelitian menunjukkan penurunan kadar Chemical Oxygen Demand (COD), dengan kata lain terdapat kenaikan kadar oksigen terlarut (DO), karena hubungan COD dan DO merupakan keterbalikan. Pada 0 menit kadar COD yaitu 782 mg/L. Setelah 60 menit kadar COD yaitu 336 mg/L, reduksi jam 57,3 %. Setelah waktu sirkulasi 120 menit kadar COD yaitu 254 mg/L, reduksi 67,52%. Setelah 180 menit kadar COD yaitu 128 mg/L, reduksi 63,63 %. Setelah dilakukan uji biologi menggunakan daphnia sp. yang ditempatkan di air limbah detergen sebelum perlakuan selama 180 menit menunjukkan mortalitas hingga 100% sedangkan setelah perlakuan rata-rata mortalitas hanya 33.3%. Penurunan mortalitas Daphnia sp. menunjukkan peningkatan kualitas air.

Kata Kunci: Bioremediasi, Biji Kelor, Lingkungan Akuatik, *Trickling System*, Daphnia sp.

ABSTRACT

Detergent is one of the daily needs of the community for washing. After washing using detergent, the used water will become detergent waste which is harmful to the aquatic environment because in detergent there is a Linear Alkylbenzene Sulfonate (LAS) cadence that cannot be decomposed by the environment. To reduce pollution of the aquatic environment from detergent waste, researchers made Bioremediation using Moringa seeds (*Moringa oleifera*) to reduce the negative effects of detergent waste on the environment. With this research, it is expected to determine the effectiveness of bioremediation using Moringa seeds in a bioremediator trickling system. And determine the effectiveness of bioremediation using moringa seeds in a trickling system bioremediator in reducing negative impacts on the aquatic environment.

The results showed a decrease in Linear Alkylbenzene Sulfonate (LAS) levels, where LAS levels before treatment were 0.02068 ppm while LAS levels after treatment were 0.02050 ppm. The decrease in LAS levels is one indicator of better water. The results showed a decrease in Chemical Oxygen Demand (COD) levels, in other words there was an increase in dissolved oxygen (DO) levels, because the relationship between COD and DO is reversible. At 0 minutes the COD level was 782 mg/L. After 60 minutes the COD level is 336 mg/L, hourly reduction of 57.3%. After a circulation time of 120 minutes the COD level is 254 mg/L, a reduction of 67.52%. After 180 minutes the COD level is 128 mg/L, reduction 63.63%. After biological tests using Daphnia sp. which was placed in detergent wastewater before treatment for 180 minutes showed mortality up to 100% while after treatment the average mortality was only 33.3%. The decrease in mortality of Daphnia sp. shows an increase in water quality.

Keywords: Bioremediation, Moringa Seeds, Aquatic Environment, Trickling System, Daphnia sp.