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**Wastewater Treatment and *E. coli* Removal Using Biochar Derived from Sugarcane Bagasse****Nimalarathna, M.P.J.R.<sup>1</sup>, Jayathilake, K.M.P.I.<sup>2</sup>, Idroos, F.S.<sup>2</sup>, Manage, P.M.<sup>2</sup>,  
Sirisena, K.K.A.<sup>1\*</sup>**<sup>1</sup>*Department of Environmental Technology, Faculty of Technology, University of Colombo,  
Colombo 03, Sri Lanka*<sup>2</sup>*Centre for Water quality and Algae research, Department of Zoology, Faculty of Applied  
Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka**\*kosala@et.cmb.ac.lk***Abstract**

Industrial wastewater has become a major problem for environmental and public health. Among various methods that have been employed to treat wastewater, biochar (BC) provides a promising solution for wastewater treatment. The aim of this study is to evaluate the efficiency of BC produced from sugarcane bagasse in treating aquaculture wastewater. In this study, BC was produced by pyrolyzing sugarcane bagasse at 300 °C. BC was chemically activated using potassium hydroxide (KOH) to improve the surface area and porosity of the BC. Both activated and non-activated BC were separately inserted as a sandwich layer in sand and gravel filters. Raw water samples collected from a brackish water shrimp farm were filtered through each filter unit. The efficiency of *E. coli* removal by the BC was evaluated using the filtration method. Water quality parameters, including pH, Chemical Oxygen Demand (COD), Ammonia, Nitrate, Nitrite, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Turbidity, and Total Phosphate (TP) were evaluated before and after treatment. Control filters were developed using only sand and gravel layers, excluding BC. Activated and non-activated BC completely removed *E. coli* from wastewater, whereas the filtrate from the control medium showed the presence of *E. coli* colonies, indicating ineffective removal in the control filter. The activated treatment system showed a decrease in pH of 12.99%, EC by 5.82%, TDS by 5.51%, and COD by 5.80%. A Turbidity removal of 74.3%, Ammonia removal of 65.9%, TP reduction of 39.4%, Nitrate reduction of 53.8% and Nitrite removal of 96.7% was also achieved. Similarly, the non-activated system showed a decrease in pH by 8.57% and TDS by 6.11%. Turbidity removal was 65.48%, showing 26.30% Ammonia removal, 39.4% TP removal, 22.07% Nitrate removal, and 95.89% Nitrite removal. The activated and non-activated BC systems exhibited higher treatment efficiency compared to the control. The present study suggests that activated sugarcane bagasse BC can be used as a sustainable alternative to other filter materials for wastewater treatment and *E. coli* removal.

**Keywords:** *Biochar, Aquaculture wastewater, Water quality parameters, Sugarcane bagasse, E. coli.*