

Sustainable Water Filter for Purification of the Aqueous Water

Gatanawaththa, G.W.S.I.W.¹, Aththanayaka, R.M.T.D.¹, Akalanka, M.K.D.¹, Wijerathna, P.A.K.² Maduranga, V.G.K.¹

¹*Department of Materials Technology, Faculty of Technology,
Rajarata University of Sri Lanka.*

*ent1718028@tec.rjt.ac.lk

Water is a precious natural resource and an integral compound for the existence of life. However, access to clean water is one of the major global concerns particularly, in the North Western province, Sri Lanka. Hence, the focus of the present study was to develop a cost-effective water filter using low-cost materials which include sand, charcoal (made from *Strychnos Potatorum* seeds) clay balls, and a composite mixture of clay and sawdust. The developed filter consisted of 5 cm height layers of each filter material with sand, Charcoal, clay balls (diameter ranged from 0.2 -0.5 cm), and clay and fired sawdust layers respectively. Further, the filter was optimized for different particle sizes and different ratios of clay to sawdust. The water samples were filtered through the developed filter and the water quality parameters were evaluated before and after the treatment. Water pH, Conductivity, DO and temperature were measured using a Thermos Scientific multipara meter (Star A 3290), and N-NO₃⁻, N-NO₂⁻, N-NH₃, COD, and hardness values were measured using APHA standard methods. The optimization studies identified that the sawdust particle size ranged from 600 µm - 900 µm and clay and sawdust to 5:10 c significant (p <0.05) treatment efficiency. Importantly, the filter system could effectively treat the N-NO₃⁻, N-NO₂⁻, N-NH₃, COD and hardness of water up to 45 ± 4%, 97 ± 1 %, 28 ± 1 %, 72 ± 3 %, and 180 ppm respectively.

Keywords: Water filter; *Strychnos Potatorum* seeds; Clay balls; Water quality