

Evaluation of Filter Media Prepared From Natural Materials to Improve the Water Quality of Drinking Water

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Abstract

Water quality is a vital factor for the human health and well-being. Even though in most of the areas in Sri Lanka have less impurity of water, people in dry zone are suffering from poor quality of water mainly due to hardness. The objectives of the study were (a) to produce filter media from natural materials such as moringa bark, rice husk, and natural sea sand, (b) to evaluate its filter media properties, and (c) to evaluate them as a filter media for the removal of hardness and turbidity in water. The filtration media were produced from natural sea sand (NSS), carbonized moringa bark (CMB) and carbonized rice husk (CRH) and they were used for the preparation of filter cartridges. Three replicates of filters were used to evaluate the filter materials. Thirty liter of water was filtered through the filter as 2L batches. The drinking water quality parameters; hardness, pH, Electrical Conductivity (EC) and turbidity were measured in raw water and filtered water. Raw water hardness (270 mg/L), EC (1130 $\mu\text{s}/\text{cm}$), Turbidity (12.0 NTU) and pH (6.2) of water were recorded and the same parameters of filtered water were also measured during the filter evaluation process. Reasonable reduction of hardness was not observed when these materials are used as filter media after converting into char. The changes of hardness in three different filter media were significantly different. However, hardness changes among moringa bark and rice husk were not significantly different. It was found that reduction of hardness in natural soil was low compared with other filter materials. However, pH and turbidity in filtered water were within the recommended limit of drinking water. Based on the results of this study, the filter materials used to reduce hardness cannot be recommended for the preparation of drinking water filter. However, further studies using the mixtures of these materials in different ratios for the removal of hardness is suggested.

Keywords: Charred Moringa Bark, Charred Rice Husk, Hardness, Natural Sea Sand

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