



Possibility of application of kenaf fibers (*Hibiscus cannabinus* L.) in water hardness reduction

Ehsan Gharehchahi^a, Amir Hossein Mahvi^{a,b,c,*}, Seyed Mahmood Taghavi Shahri^a, Rahim Davani^d

^aSchool of Public Health, Tehran University of Medical Sciences, Tehran, Iran

Email: ahmahvi@yahoo.com

^bCenter for Solid Waste Research, Institute for Environmental Research, Tehran University of Medical Sciences, Tehran, Iran

^cNational Institute of Health Research, Tehran University of Medical Sciences, Tehran, Iran

^dShiraz Health Center, Water and Wastewater Laboratory, Shiraz University of Medical Sciences, Shiraz, Iran

Received 29 April 2012; Accepted 30 May 2013

ABSTRACT

The increasing demand for high-quality water has resulted in the development of new and cost-effective techniques for water softening. The main aim of the present study was to investigate the capillary effect of kenaf (*Hibiscus cannabinus* L.) on water softening. Water samples were taken from water distribution system of Shiraz city with hardness of 352, 466, 502, and 612 mg/l as CaCO₃. Two different lengths of kenaf (1.2 and 1.9 m) were tested. Hardness reduction efficiency for two lengths of kenaf were tested in the timescales of one, two, three, and five hours and were analyzed with linear mixed model (Alpha = 0.05). Results showed that the average of hardness reduction was 108.43 and 163.74 mg/l as CaCO₃ for kenaf with lengths of 1.2 and 1.9 m, respectively. The maximum hardness reduction was achieved at the first timescales of filtration and during the 5 h of filtration, the average of efficiency for the two lengths decreased from 53.03 to 4.54%. The results also indicated that the length of kenaf has a dominant positive effect on water hardness, while time has a negative effect. This study confirms that kenaf has a considerable potential in water softening.

Keywords: Hardness reduction; Water softening; Kenaf; *Hibiscus cannabinus* L.

*Corresponding author.