Abstract

Access to portable water remains a major global concern due to increased rate of water pollution, accelerated urbanization, high population, industrialization and intense agricultural activities that destroy riparian zones thus exposing rivers and streams to toxic and pathogenic pollutants from untreated organic and inorganic waste. Exposure of streams used for drinking water to pollution is detrimental to consumers. Nkenye stream in Meru South is depended upon for the use in fish ponds, irrigation and provision of water for domestic use. Nonetheless, little attention has been accorded to acertain the chemical and biological quality of the flowing water and that of the water bed despite of the stream being located in an urban area with high exposure to pollutants. Pressure on Nkenye wetlands ecosystem that habours Nkenye stream has seen major destruction of vegetation leaving just few plant communities such as *Commelina banghalensis* whose water purification potential is not well known. This study was conducted to determine water quality of Nkenye stream and water purification capacity of *Commelina banghalensis* along this stream. Samples were collected at designated locations using ecological survey method and taken to Chuka University for analysis. However, water temperature, pH and dissolved oxygen were determined *in situ* using Hanna conductivity meter. In the laboratory. Macrophyte roots were cleaned and dried then powdered and digested using nitric acid. The sediment samples were dried, ground to pas a 2 mm non-metal sieve, digested samples were diluted and analyzed using atomic absorption spectrometry model PG990 at Chuka University. The concentration of anions was determined by ion chromatography at Chuka University Chemistry laboratory. Coliform analysis of water samples was done by most probable number method using Macconkey purple broth at botany laboratory, Chuka University. The results obtained from the field and laboratory were analyzed by General linear model (GLM) on Statistical analysis system (SAS) version 9.4 and significance means separated by Least significance difference (LSD) [alpha = 0.05]. The results showed that Nkenye stream is polluted with iron, copper and lead. However, the concentration of iron and copper were within the set standards by the World Health Organization while lead was slightly higher by 0.02 ppm. Feacal coliform were found not to conform to WHO standards of o cfu/100 ml as the mean of 10 cfu/100 ml was observed for the entire stream. In conclusion, metal pollutants were significantly different from location to location of sampling. However, the concentrations were within the WHO standards for drinking water. The metals contaminants observed in the Nkenye stream water, sediments and root samples may be associated with discharge of wastes from Chuka town particularly wastes from car wash, garages and from farms that surround the stream and the wetland. Considerable amount of lead, copper and iron was observed in the root samples of *Commelina banghalensis.* This shows that the plant can be utilized in the removal of the above cations in the Nkenye stream. The study recommends that local authorities particularly Tharaka Nithi County government should provide waste management disposal systems and policies that prohibit direct discharge of effluents or any other industrial based wastes into the stream. The County government should enact policies that prohibit cultivation along the stream or any activity that endanger the riparian zones of Nkenye stream. Lastly, first growing macrophyte plants such as *Commelina banghalensis* should be adopted and planted as a buffer zone between the stream and the land bordering upstream of the stream to trap and retain harmful wastes that otherwise would find their way into the water body.