



IS IT SAFE TO DRINK WATER IN MIHINTALE? A CASE STUDY FROM DISEASE ENDEMIC AREAS OF THE CHRONIC KIDNEY DISEASE OF UNKNOWN AETIOLOGY (CKDu).

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Chronic Kidney Disease of unknown aetiology (CKDu) which is a major health concern throughout the North Central Province of Sri Lanka, may be strongly associated with the quality of drinking water. This study attempts to evaluate the cytogenotoxic potential of drinking water in Mihintale in the Anuradhapura District with an *Allium cepa* bioassay. Water samples were collected from drinking water sources and physicochemical parameters such as temperature, pH conductivity, Ca²⁺, Mg²⁺, total hardness, F⁻, nitrate, phosphate, and heavy metals such as As and Cd were tested with standard procedures. Common endpoints of the *A. cepa* bioassay; mitotic index and the percentage aberrations, were considered for cytogenotoxic screening. Among 30 samples collected the sources ranged from wells (19), tube wells (7), tap water (1), filtered water from a reverse osmosis system (1) and rain water (1). Principal components that determined the toxicity were derived as Ca²⁺, Mg²⁺, total hardness and conductivity that linked together (PCA, >0.8 of coefficient) to contribute to the ionicity of water. Thus, percentage aberrations were strongly and positively correlated with these parameters. As the second cluster of components of PCA, fluoride and pH contribute to moderately higher percentage aberrations. Filtered water and rain water resulted in minimum cellular aberrations; these sources can be treated as safe sources from a cytogenotoxic perspective. As declined contents of electrolytes in filtered water may possibly trigger unexpected health concerns, rain water harvesting could be recommended as a better alternative for ground water sources with an improved collecting system to avoid fecal and other contaminations.

Keywords: CKDu, Drinking water, Cytogenotoxicity, *A. cepa* Bioassay, Percentage aberrations

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