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 Sri Lanka.

 insight.centre@gmail.com

 +94 76 175 3553



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Concentration of Algal Toxins in Drinking Water in Irakkamam DS Division of Ampara, Sri Lanka where Chronic Kidney Disease of Uncertain Etiology (CKDu) is Prevalent

AMM. Asmath¹, MMM. Najim², MM. Musthafa^{1*}, UL. Abdul Majeed¹, LF. Zisath Shama³

¹Department of Biosystems Technology, Faculty of Technology, South Eastern University of Sri Lanka.

²Faculty of Agriculture, Universiti Islam Sultan Sharif Ali, Sinaut Campus, Brunei Darussalam, Brunei.

³Department of Information and Communications Technology, Faculty of Technology, South Eastern University of Sri Lanka.

muneeb@seu.ac.lk

Chronic kidney disease of uncertain etiology (CKDu) and CKDu related deaths have risen exponentially in Dehiattakandiya, Padiyathalawa and Mahaoya District Secretariat Divisions (DSD) in Ampara District in the Eastern province. An increasing number of CKDu cases were recently reported from Irakkamam DSD in Ampara District. Even though Irakkamam DSD is not identified as a high-risk DSD for CKDu, there has been an increasing trend of CKDu recently as per the preliminary surveys conducted. No studies have been reported from Irakkamam DSD to find out the influencing factor associated with CKDu. Algal toxins play an important role among the suspected contributing factors to CKDu. Therefore, the present study aimed to analyse the concentration of algal toxins in drinking water to find out the association with the occurrence of CKDu. Ten different geographical locations were selected to collect water samples from various water sources including dug wells, tube wells, canals, reservoirs, and water supply from the national water board in Irakkamam DSD in April 2022 during the dry season to determine the concentrations of algal toxin. Enzyme-linked immunosorbent assay (ELISA) method was used to determine the algal toxins of Cylindrospermopsin and Microcystin. The statistical analysis was performed using SPSS software. Algal toxin was only found in one certain point of the reservoir area out of the ten locations sampled. Further, the concentration of Microcystin was detected as 1.576 ± 0.06 $\mu\text{g/L}$ in that location, which did not exceed the standard level of 2.0 $\mu\text{g/L}$ (SLS 614:2013). Moreover, Cylindrospermopsin was not detected in drinking water samples analysed. Further, serum creatinine levels of the CKDu patients were non-significantly ($p > 0.05$) correlated with the concentration of algal toxins. So, algal toxin is not a significant key determinant related to CKDu in Irakkamam DSD. Therefore, to identify a potential etiological causing factor for the CKDu in Irakkamam DSD, other hypotheses should be developed.

Keywords: Algal toxin, drinking water, lifestyle, kidney disease