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#### Detection of microcystin and nodularin in water and rice samples collected from CKDu endemic Girandurukotte, Sri Lanka

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**Background:** Cyanotoxins get into the human body via drinking and consuming edible plants irrigated with cyanotoxin-contaminated water. Cyanotoxins have gained serious attention due to their nephrotoxic, hepatotoxic and neurotoxic activities.

**Objectives:** The presence of microcystins (MCs) and nodularin (NOD) in water and rice samples collected from CKDu endemic Girandurukotte were investigated.

**Methods:** Totalling 53 water samples, including well waters of CKDu (n=25), CKD (n=9), and healthy residents (n=12), reservoirs (n=2), water treatment plant (n=1), tube-wells (n=2) and springs (n=2) were collected. Water samples were inoculated into cyanobacterial-specific BG11 medium. Rice samples (n=31) were also collected from above-mentioned residents. Methanol extracts of each sample were analysed by high-performance liquid chromatography (HPLC) to detect the presence of MCs and NOD using SIGMA-ALDRICH 33578 as MC RR-YR-LR standard and SIGMA-ALDRICH 32539 as NOD standard.

**Results:** Among microscopically identified cyanobacteria, *Phormidium, Oscillatoria, Anabaena* and *Merismopedia* are potential MC producers, while *Nostoc* produces both MC and NOD. Except for tube-well samples, HPLC chromatograms showed the presence of one or more MC variants, in 44.4% CKD, 40% CKDu, 41.6% healthy individuals' well water samples, one from each category of water samples collected from reservoirs, springs and the water treatment plant. The presence of NOD was observed in 12% CKDu patients' well water, one from reservoirs and tube-well samples. Water samples collected from CKD and healthy individuals' wells, springs and the water treatment plant did not show a peak for NOD. 32% of tested rice samples showed the presence of one or more MC variants while none showed the presence of NOD.

**Conclusion:** Results indicate the presence of cyanotoxins in water sources and rice, particularly in CKDu endemic areas. It highlights the importance of quantifying cyanotoxins to investigate the ability of posing a human health risk. The research study is in progress, to find the possibility of cyanotoxins to be a CKDu risk factor.

**Keywords:** *CKDu, Cyanotoxins, Drinking water, Rice Acknowledgement: National Science Foundation grant ICRP/NSF-NSFC/2019/BS/01*